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Emissions from Heavy-Duty Engines Using the 1984 Transient Test Procedure Volume I: Gasoline

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This volume of the two-volume report describes the heavy-duty, gasoline engine baseline emissions evaluations conducted at Southwest Research Institute. Initially, a facility was developed which was capable of complying with the requirements in the 1984 dynamometer transient procedure. Seventeen gasoline engines were then tested over the transient and the nine-mode emissions test procedures. Included were 1969 model year engines for HC baseline, 1972-73 engines for NO_x baseline, and 1978-79 engines for correlation purposes. Emissions measured were hydrocarbons, carbon monoxide, and oxides of nitrogen on all engines.

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ABSTRACT

This volume of the two-volume report describes the heavy-duty, gasoline engine baseline emissions evaluations conducted at Southwest Research Institute. Initially, a facility was developed which was capable of complying with the requirements in the 1984 dynamometer transient procedure. Seventeen gasoline engines were then tested over the transient and the nine-mode emissions test procedures. Included were 1969 model year engines for HC baseline, 1972-73 engines for NO_x baseline, and 1978-79 engines for correlation purposes. Emissions measured were hydrocarbons, carbon monoxide, and oxides of nitrogen on all engines.

FOREWORD

This project was initiated by the Standards Development and Support Branch, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105. The effort on which this two-volume report is based was performed by the Department of Emissions Research, Southwest Research Institute, 6220 Culebra Road, San Antonio, Texas 78284. This project, authorized by Contract 68-03-2603, began on September 26, 1977 and was completed on July 1, 1981.

The SwRI Project Leader was Mr. Sherrill Martin. Mr. Charles Urban assisted in supervising the gasoline engine, NO_x baseline phase of this project. Mr. Karl Springer was the Project Manager and was primarily responsible for the technical and fiscal negotiation of the initial project and subsequent modifications.

The initial Project Officer was Mr. Richard Nash of the Standards Development and Support Branch, Environmental Protection Agency. Subsequent Project Officers were Mr. Richard Burgeson, Mr. Timothy Cox, and Mr. Eugene Danielson. This project was identified within Southwest Research Institute as Project 05-5044-001.

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1. SUMMARY

The major objective of this project was to obtain baseline emissions data on heavy-duty engines using the Transient Test Procedure.(1)* This involved developing the necessary dynamometer control and data acquisition systems and then utilizing these systems to evaluate engine emissions over the transient cycle. With the gasoline engines, emissions evaluations over the nine-mode procedure and at idle were also conducted.

The data generated in this project, along with data generated at the EPA, were utilized by the EPA to establish baseline values for HC, CO, and NO_x. These baseline emissions values, along with a summary of the source data, are given in EPA reports.(2,3)

Emissions data were generated on a total of seventeen gasoline engines, three of which were tested more than once. Nine of these seventeen engines were 1972-73 model-year engines which provided data for the NO_x baseline determination. Of the other eight engines, five were 1969 model-year for HC and CO baseline, and three were 1978-79 model-year representative of the then current technology. In addition to the generation of data to be incorporated into the emissions baseline for heavy-duty gasoline engines, a number of the findings appear to be of importance. Several of these findings are included in this summary.

With the 1972-73 model-year engines, there did not appear to be any direct relationship between HC and CO emissions at idle and in the transient test. With CO, the two engines with the higher CO values at idle produced the lower amounts of CO in the transient tests. Also, with these 1972-73 engines, the methane emissions in the transient cycle were between four and eight percent of the total hydrocarbon emissions, with an overall average of six percent.

The relationship between some of the emissions in the transient and nine-mode tests appeared to be dependent on the model-year of the engine. This is illustrated by the following data summary:

	Transient ÷ Nine-mode Values, in %			
Engines	HC	CO	NO_x	Fuel
Avg. of nine 1972-73	83	225	91	95
Avg. of three 1978-79	320	230	107	93

As shown, for the 1972-73 engines, the average CO emissions was twice as high in the transient tests than in the nine-mode tests, while HC and CO were

*Numbers in parentheses indicate references at the end of this report.

slightly lower. For the 1978-79 engines, CO was also twice as high, but HC was three times higher and NO_x was slightly higher, in the transient tests than in the nine-mode tests. With the 1972-73 and the 1978-79 engines, the average fuel consumption was slightly lower in the transient tests. Of primary interest, however, was that the transient to nine-mode HC emissions ratio was lower for the 1972-73 engines and substantially higher for the 1978-79 engines. This is indicative that HC emissions in the nine-mode test does not accurately reflect the HC emissions produced under transient operation.

Another significant finding was the importance of conducting extensive tune-ups, component checks and diagnostic testing on in-use engines prior to acceptance for testing. Some example findings were incorrect components on the engines, grossly incorrect adjustment of idle-mixture, and defective components.

II. INTRODUCTION

This two-volume report describes the program to evaluate emissions from heavy-duty gasoline and diesel engines used in vehicles over 8,500 pounds GVW. These emissions evaluations involved the use of the 1984 Transient Test Procedure. This volume, Volume 1, reports the results of evaluations conducted on gasoline engines. The second volume covers evaluations of diesel engines.

A. Project Objective

The primary objective of this project was to obtain baseline emissions data on heavy-duty engines using the Transient Test Procedure. Meeting the objective, initially, required the development of appropriate dynamometer control and data analyses systems.

B. Emissions Test Procedures

With the gasoline engines, nine-mode and transient test procedures were utilized in this project. At the time this project was initiated, the Transient Test Procedure was in draft form and the ability to run this transient test remained to be demonstrated. This transient test cycle involves relatively rapid, simultaneous changes in engine speed and power output.

C. Engines Evaluated

Three groups of gasoline engines were evaluated in this project. These were 1969 model-year engines for HC and CO baseline, 1972-73 engines for NO_x baseline, and 1978-79 engines for correlation purposes. A total of twenty-one engine test series were conducted involving a total of seventeen different engines. Nine of the seventeen engines were 1972-73 model-year, for use in the NO_x baseline. At the start of this project, most of the engines received had been removed from the vehicle prior to shipment to this laboratory. As the project progresses, most of the engines were removed from the vehicle at this laboratory.

D. Engine Testing

The test plan underwent changes as the project progressed, with finalization occurring during the evaluations of the NO_x baseline engines. During the latter part of the project, a test series on an engine consisted of checking the engine prior to removal from the vehicle, performing an extensive tune-up after mounting on the test stand, and then conducting duplicate transient, nine-mode and idle evaluations.

E. Project Reviews and Modifications

A number of meetings, discussions and reviews were held, with the Project Officer and cognizant individuals from the EPA and/or engine manufacturers, during the course of this project. All of the changes which occurred were subsequently incorporated into a revised Scope of Work during the conductance of the gasoline engine, NO_x baseline evaluations. Copies of the revised and the initial Scopes of Work are included in Appendices A-1 and A-2.

III. OPERATIONAL EQUIPMENT

Conductance of the transient evaluations required the development and application of some advanced dynamometer control systems. In addition, environmental controls were subsequently required. This section describes the equipment and controls utilized in this project. Illustrative views of the systems are given in Figure 1.

A. Dynamometer and Controls

The overall control scheme for the transient tests consists of two independent closed-loop systems. The speed is controlled by the dynamometer, and the torque by the engine. An alternate control scheme was briefly considered, but it was concluded that such a scheme could not lead to stable operation below the peak torque speed of the engine, particularly on cold-start tests.

The dynamometer system consists of an Eaton Dynamatic Model E-2000, with proprietary quick-unload circuitry. This dynamometer has a motoring capacity of 150 kW (200 hp) and an absorption capacity of 373 kW (500 hp). The quick-unload circuitry was necessary to speed up the ordinarily sluggish response of this type of dynamometer. Although this dynamometer can absorb power at speeds of up to 5000 rpm, the motoring speed was a maximum of 3500 rpm. The EPA ran comparison tests to determine whether this limitation had an effect on emissions and concluded that any such effect was insignificant.

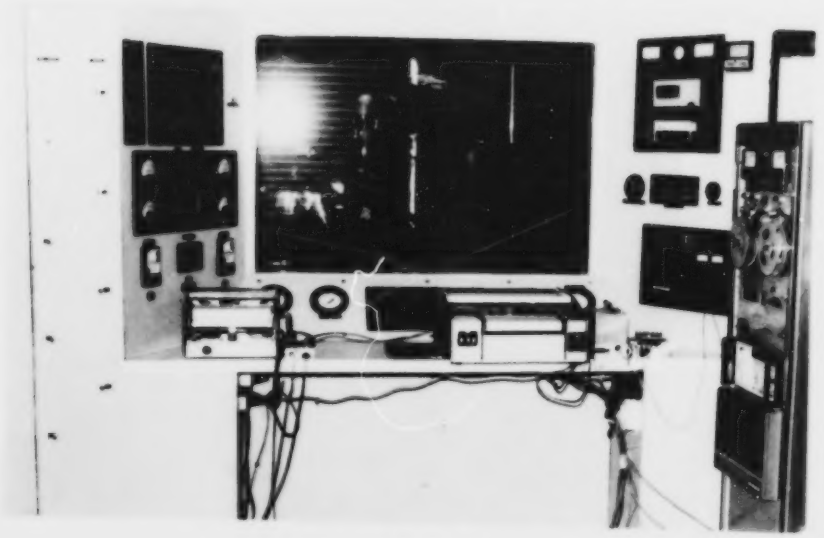
To provide transient command signals, a Remex paper tape reader and a Northern Ampower Corporation digital programmer provide continuous analog output, redirected at one second intervals. This system was available and was found to be adequate for use in this application.

Speed control feedback is provided by a D.C. tachometer which is directly driven by the dynamometer.

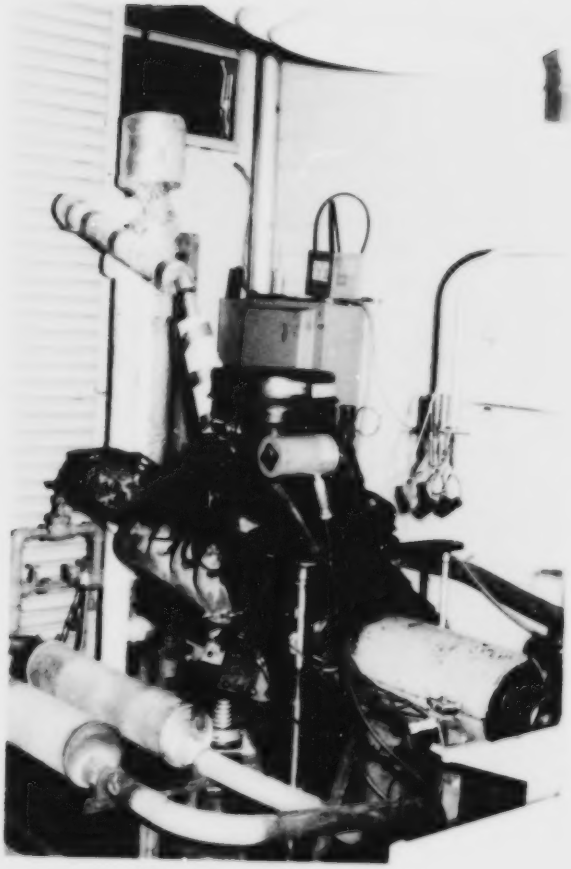
The torque control loop consists of the following main elements:

- Analog command signal
- Servo amplifier
- Servomotor attached to throttle
- Driveshaft torquemeter
- Strain gage conditioner

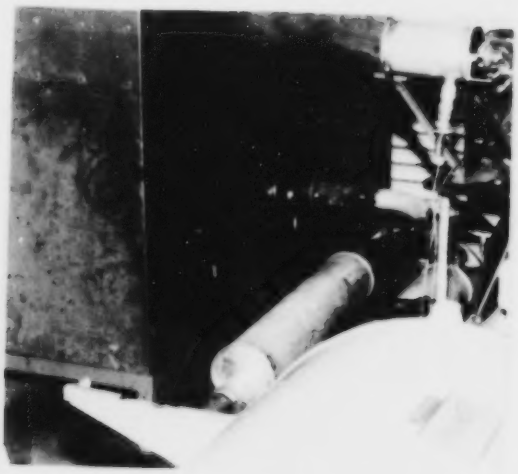
The analog command from the Northern Ampower programmer is fed to the torque command inputs of the servo amplifier. The signal from the strain gage conditioner goes into the torque feedback input. An error amplifier decides the direction and magnitude of the current to the throttle/servomotor. Two adjustments are available on the servo amplifier. The span control adjusts the torque command level appropriately for the engine begin tested. The gain



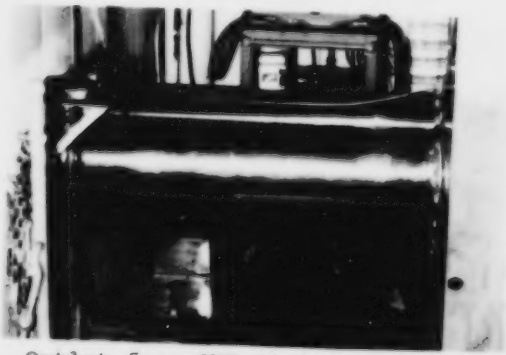
Control Console



Engine on Test Stand



Inlet to CVS Mixing Chamber



Outlet from CVS Mixing Chamber

Figure 1. Views of the transient procedure test facility.

control adjusts the responsiveness of the system. It is adjusted to the position at which minor oscillation begins at a couple of points in the cycle.

B. Environmental Controls

The gasoline test cell has two environmental control systems. The first is a wall-mounted air conditioner which insures that the test cell is the proper temperature for an overnight cold soak. Beginning with the first NO_x baseline engine, the Project Officer requested that humidity, as well as temperature, be controlled during the test. To accomplish this, a second system was constructed which provided conditioned air directly to the test cell. Filtered air from outside the building is passed through a chilled water spray chamber to establish the proper absolute humidity level. The air then passes through a demistor followed by an electrically heated reheat section to establish a 25°C (77°F) temperature. Temperature and dewpoint are monitored as closely as practical to the engine inlet. Humidity control requirement was 10.7±2.1 grams of water per kilogram (75±15 grains of water per pound) of dry air. Generally, the actual control of humidity was significantly better than these limits.

C. Exhaust Dilution System

The CVS system used was essentially a scaled-up version of the system used for emissions testing of light-duty vehicles.[5] Nominal CVS flow rate utilized was 40 m^3/min (1400 CFM). This CVS flow is that necessary to prevent water condensation in the bags for the high speed and power Los Angeles driving segment, without over diluting the exhaust during the New York Non-Freeway segment of the cycle.

IV. EMISSIONS SAMPLING AND ANALYSES

The test cycles included in this project involved transient, nine-mode and idle operation. Although these cycles remained essentially unchanged throughout this project, some significant changes did occur in the emissions sampling and measurement. These changes are identified and discussed in this section of the report.

A. Transient Evaluations

At the time this project was initiated, the transient test procedure was still under development. The recommended practice, intended to go into effect for 1983 engines, existed only in draft form. Initial tests were performed under the guidelines in the original Scope of Work.

The purpose of the transient tests is to provide a more realistic simulation of the on-the-road driving conditions during emission sampling, than the previous steady-state tests could provide. The transient test procedure, as enacted into law for the 1984 model year, is described in detail in Reference 1. The elements of the procedure, as conducted at SwRI during this baseline program, are described as follows:

- The engine is mapped for maximum available torque versus speed over the range of speeds encountered during the transeint test. This speed range is from 400 rpm (or 200 rpm below idle, whichever is higher) to 15 percent above rated speed. The mapping is accomplished in a single sweep from low speed to high speed, pausing 15 seconds at 100 rpm intervals. The torque is read during the last 5 seconds of the pause.

- The required cycle is determined, at one second intervals, in terms of rpm and torque.

- Practice runs are made to insure that the regression line tolerances are being met.

- After an overnight soak, a cold start transient test is run. Whereas the procedure calls for only a single emissions sample bag to be taken during the test for baseline purposes, four bags were taken, dividing the test into four subcycles. In this way, emission factors for various types of driving were obtained for future use in emission inventory and impact analysis.

- After a twenty-minute soak, the cycle is repeated for a hot-start test.

- The regression line data is analyzed to determine if the cycles were run within required tolerance.

- The emission data is analyzed and results for the cycle computed.

The following four gaseous emissions were measured:

- Hydrocarbons (HC)
- Carbon Monoxide (CO)
- Carbon Dioxide (CO_2)
- Oxides of Nitrogen (NO_x)

All emissions were measured from bagged samples.

At the start of this project, a statistical method for determination of cycle validation was not available. Therefore, the test cycles for Engines 1 through 6 were validated by examination of speed-torque traces recorded during the tests. Beginning with Engine 7, the test cycles were validated by the regression line analysis called for in the proposed regulations.(1) The only deviation from these proposed regulations as the tests progressed was in the regression analysis criteria; these were relaxed somewhat as a result of experience gained at the EPA.

B. Nine-Mode Evaluations

The 1979 nine-mode procedure was utilized with Engines 1 through 11. This procedure involved modes based on a percentage of maximum torques and continuous sampling of the undiluted exhaust. An individual bagged sampling procedure was utilized with Engines 13 through 22. Nine-modes tests were not conducted on Engine 12.

1. Continuous Sampling of Undiluted Exhaust

The 1979 nine-mode test procedure is fully described in the Federal Register.(6) Briefly, it involves running a sequence of nine modes twice, staying in each mode for one minute. Emissions are recorded continuously in each mode for one minute, but the emissions data are read only during the last ten seconds in each mode, except for cut-throttle. For cut-throttle, the emissions data are read during the last 50 seconds. The test sequence is conducted at a steady speed of 2000 rpm, except for the idle modes.

During the early part of the test program, there was a growing concern about the reliability of NO_x measurements of raw exhaust by the methods then used. These concerns were described in a memorandum.(7) In view of these problems, the Project Officer directed that remaining nine-mode tests be carried out under a modified procedure which measured emissions by a dilute bag method. This procedure was already in use at the EPA.

2. Bagged Sampling of Diluted Exhaust

In accordance with a telephoned directive from the Project Officer, the use of bagged samples of diluted exhaust was incorporated into the

project, starting with Engine 13.[8] In a cursory comparative evaluation, this method produced NO_x results which were essentially equivalent to those results produced by continuous sampling. The primary benefit of using bagged samples was that they could be conducted at a greatly reduced level of effort. Engine speed and load settings for each mode were the same as used in the previously described procedure involving continuous sampling.

A copy of the bagged sample nine-mode procedure is given in Appendix A-3 and is briefly described as follows:

- Go to Mode 1 and stabilize in one minute.
- Take bag sample for five minutes.
- Repeat stabilization and sampling for Modes 2 through 9.

The five minute modes enabled using the same bag sampling system as was utilized for the transient evaluations. A hand operated throttle was used in these nine-mode evaluations.

The modal emission concentrations were converted to mass emissions using a standard single bag computer program. The composite nine-mode results were then calculated using these modal mass emissions, the time per mode, the modal power output, and the modal weighting factor.

3. Idle Tests

Emissions were measured at idle on all gasoline engines evaluated. Through Engine 15, these evaluations included the standard idle speed and a no-load speed of 2500 rpm. Subsequent to Engine 15, the evaluations at 2500 rpm were discontinued as directed by the EPA Project Officer.

With Engines 1 through 15, undiluted HC and CO were measured on a garage-type emissions analyzer and undiluted CO_2 was measured using a laboratory grade analyzer. In addition, bagged samples of CVS diluted exhaust were analyzed for HC, CO, NO_x and CO_2. Subsequent to Engine 15, the use of the garage-type analyzer was discontinued as directed by the EPA Project Officer. The garage-type analyzer used was unstable and unreliable, thereby requiring an excessively high level of effort to maintain and operate.

For Engines 14 through 22, HC and CO emissions, on an undiluted basis, were calculated using the measured diluted values and the ratio of the undiluted to diluted CO_2 concentration. With Engine 15, extra special care was taken in measuring the undiluted emissions using the garage-type analyzer to use in comparisons of the measured and calculated values. The calculated CO emissions were four percent higher than measured values, an essentially insignificant difference. With HC, the garage-type analyzer measured in ppm hexane and the dilute emissions were measured in ppm carbon. This factor makes comparison of the HC values to be inappropriate.

4. Methane Analyses

With Engines 17 through 22, methane was determined for the transient cycle tests using the SAE J1151 procedure "Methane Measurement Using

Gas Chromatography." The same bagged sample was used for measurement of methane as was used for the regulated emissions. As specified by the EPA Project Officer, the methane in g/kW-hr was calculated by multiplying the mass rate of total hydrocarbons by the volumetric ratio of methane.

V. TEST PLAN, PREPARATIONS, AND DATA REDUCTION

This section describes the test plan followed, the preparations for testing, the fuel and lubricant used, and the methods utilized for analyzing the data.

A. Test Plan

The original test plan is shown in Appendix A-2. Due to numerous changes that occurred, subsequently, a modified Plan of Performance was prepared. This modified Plan of Performance incorporated the operating changes that were put into effect by the EPA Project Officer.

Some examples of the project changes that occurred which significantly affected the effort were:

- Several engines, upon receipt, were not testworthy and others required considerable verification and some required mechanical repair.
- Rework and repair during tune-up (i.e., governors, carburetor linkage, etc.) was more extensive than anticipated.
- Additional cycles and emissions determinations, such as nine-mode and methane evaluations.
- Technical difficulty in following cycle and meeting the prescribed cycle parameters.

Although the basic purpose of this contract remained the same, many of the specific goals and the methods for achieving the goals changed. The final Scope of Work is shown in Appendix A-1.

B. Engine Preparation and Tune-Up

At the start of this project, the engines were mounted onto the test stand, given a minor tune-up, and tested. Repairs, such as replacement of leaky valves in the engine, were not allowed in the original Scope of Work. As the project progressed, the engines were being received mounted in a truck and were checked over prior to mounting on the test stand. Subsequently, even more extensive tune-ups, and further assurances that the engine met manufacturer's specifications, were incorporated into this project. With the last several engines evaluated, some mechanical repair was conducted prior to testing.

Engines 1 through 3 - During this period in the project, only the four following tune-up items were to be checked: idle speed, idle CO, timing, and dwell. New engines were to be adjusted to manufacturer's specifications, if necessary. Used engines were tested as-received, then tuned-up and retested. Correlation engines received from EPA were to be tested as-received, except for possible idle-speed adjustment.

Engine 4 - For this engine, additional requirements included a compression check, valve lash adjustment (if applicable), and replacement of several components during the tune-up.

Engines 5 through 15 - For these engines, preparation was governed by an "Engine Tune-Up Specifications Check List," provided by the Project Officer. The main additional requirement was for the distributor advance curve. During this period, carburetor adjustments, other than idle speed and governor operations, were not made.

Engines 16 through 22 - With these engines, an initial examination was conducted before removal of the engine from the vehicle, carburetor air/fuel mixture was adjusted, more extensive component checks were made, and some rework of the valves was conducted. The final modifications to the data sheets were used for Engines 19 through 22, but there were no major changes with Engines 19 through 22, relative to Engines 16 through 18. Generally, only a few additional checks and diagnostic tests were incorporated. The details of the tune-up requirements can be obtained from the tune-up data sheets, which are included in Appendix E.

C. Fuels and Lubricants

A single batch of EM-267 leaded exhaust emissions fuel was used for all emissions tests conducted in this project. The properties of this fuel are given in Table 1. This fuel meets all of the requirements of the fuel described in the proposed regulations.[1] The lubricant used throughout this project was Mobile Delvac SAE 30.

D. Data Reduction

Data taken during the engine tests included:

- Test Validation
- Emissions Data

Test validation was achieved by means of a Fluke 2240B Datalogger, which scanned the speed and torque command and feedback channels, as well as the throttle position, once per second. The channel scan rate of 15 channels per second, along with the order of scanning, resulted in a 200 millisecond delay between recording of the torque command and feedback signals. At the same time, a 70 millisecond delay was experienced between the recording in a suitable format on 7-track tape. The tape was then processed on a Hewlett-Packard computer at a neighboring department of the Institute to determine if the test met statistical specifications. The program listing and sample printouts are given in Appendix A-4. An additional requirement was that the

TABLE 1. DESCRIPTION OF EM-267 LEADED GASOLINE

	EM-267	Specifications in the Proposed Regulations[1]
Specific Gravity, at 60°F	0.744	--
Reid Vapor Pressure, psi	9.1	8.7-9.2
Research Octane No.	101	90 min
Lead, g/gal	2.6	1.4 min.
Sulfur, Wt%	0.003	0.10 max.
Distillation, °F (% Evaporated)		
IBP	85	75-95
10%	134	120-135
50%	218	200-230
90%	309	300-325
EP	360	415 Max
Hydrocarbons, Vol. %		
Aromatics	27	35 Max.
Olefins	1	10 Max.
Saturates	72	Remainder

integrated work for the cycle must fall within the limits of +5 to -15 percent of the calculated reference work. This was determined by continuously integrating a horsepower feedback signal derived from the torque and speed feedback signals.

Emissions data reduction was conducted in accordance with the method described in the proposed rules.(1) Diluted gas samples were collected in bags and analyzed in a bag analysis cart for HC, CO, CO_2, and NO_x. The computer programs and subroutines used in calculating the transient emissions were derived from the bag analysis programs already in use for light-duty testing. Modifications were made to accommodate the fact that the transient cycle was divided into four segments (NYNF, LANF, LAF, NYNF), and bag samples were taken for each cycle. The computer programs calculated emission values for each segment, as well as a composite for the entire cycle.

E. Data Reporting Formats

The data generated in this project were reported to the EPA in several different formats. These formats are briefly described as follows:

Data Summary - The most pertinent data were summarized and these summaries were used in the progress reports and are included in Appendices B, C, and F.

Emissions Computer Coding Sheets - Data obtained were entered onto computer coding sheets (HD BASELINE TEST) that were provided by the EPA.

Engine Computer Coding Sheets - Engine information was entered onto computer coding sheets (HEAVY DUTY ENGINE INFORMATION) provided by the EPA.

VI. HC AND CO BASELINE TESTING

The HC and CO baseline testing involved 1969 heavy-duty gasoline engines. Emissions are reported for transient and nine-mode tests.

A. Engines Tested

Five different 1969 heavy-duty gasoline engines were evaluated in the HC and CO baseline phase of this project. The engines, and the heavy-duty vehicles from which they were removed, are identified in Table 2.

Three of the five engines were received mounted in the respective trucks. Two of the engines were received in shipping crates. Engines 2 and 13 were tested at the EPA prior to shipment to this laboratory. Engine 5 was retested as Engine 9.

B. Engine Tune-up and Maintenance

During the HC and CO baseline portion of this project, the tune-up procedure and scope evolved in response to the as-received condition of the engines. The original test plan for in-use engines required testing as received, checking of the idle speed, idle CO, timing, and dwell, adjusting these parameters if necessary, and retesting. Subsequent requirements added the replacement of accessories, compression testing, and valve adjustment, and deleted carburetor mixture adjustment.

Tune-up and maintenance performed on each engine is briefly described as follows:

Engine 2 - This was a correlation engine, previously tested at EPA. Therefore, no adjustments were desirable. However, the idle speed as received was 360 rpm. This was adjusted to 700 rpm, the manufacturer's specification.

Engine 3 - Besides adjusting the basic four parameters, the plugs, points, and condenser were replaced.

Engine 4 - In addition to the adjustments and replacement items for Engine 3, a compression check was performed and the distributor cap, rotor, spark plug wires, oil and fuel filters, and PCV valve were replaced.

Engine 5 - In addition to the items covered in the tune-up of Engine 4, the valves were adjusted (Engine 4 had hydraulic lifters). In accordance with the tune-up check list provided by the EPA, the idle CO was not checked or adjusted. The distributor advance curve was checked and found

TABLE 2. 1969 HC AND CO BASELINE ENGINES TESTED

Engine Number	Engine Description: Model Year	Make	CID	Serial Number
2	1969	IHC	304	304-648048
3	1969	IHC	345	345-687073
4	1969	IHC	304	V304-735364
5 & 9	1969[a]	Chevrolet	366	3955274T
13	1969	Ford	360	9E13F[b]

Engine Number	Heavy-Duty Vehicle Description: Model Year	Make	Serial Number
2	--	--	--
3[c]	1969	IHC	ND
4	1969	IHC	004160H937177
5 & 9	1969	Chevrolet	SE529P854232[d]
13	--	--	--

[a] Engine 9 was a retest of Engine 5.
[b] Number from Engine Identification Tag.
[c] Truck was rented from owner in Kentucky.
[d] Engine 5 & 9 came from a Model C-50 School Bus.

to be out of specification. The advance springs were replaced to achieve proper advance. The governor was found to be disconnected and was still inoperative when connected. The cross shaft in the distributor was excessively worn. GM provided a new distributor. The carburetor secondary actuator had a split diaphragm, which was replaced.

Engine 9 - This was the same engine as Number 5, after it had been shipped to the EPA and returned. In compression checks, the compression within the cylinders varied from 75 to 105 as Engine 5 and from 65 to 120 as Engine 9.

Engine 13 - This engine was previously tested at EPA, therefore, no tune-up was performed. When 9-mode tests were run on this engine, the HC emissions were nearly double those obtained by EPA, with a factor of ten difference in the 10 percent mode. It was concluded that some aspect of the engine had changed since the transient tests had been run. Investigation showed that the vacuum advance diaphragm had developed a leak. Replacement of the diaphragm had no noticeable effect on HC emissions. The Project Officer decided to move on to the next engine.

C. Emissions Test Results

Summaries of the emissions test results and copies of the computer printouts are given in Appendix B. Brief summaries of the results are presented in this section of the report.

The transient and nine-mode emissions results are summarized in Table 3. Of interest in these data are the nine-mode HC results for Engines 2 and 4 and the significant differences between most of the results with Engines 5 and 9. These areas of interest are discussed as follows:

Engines 2 and 4 - With Engines 2 and 4, the CO concentration at idle (based on nine-mode data) was 8 to 10 percent and about 75 percent of the total nine-mode composite HC was produced in the idle and cut-throttle modes. The values for all emissions with these two engines were very similar as shown in the following summary:

	Values in g/kW-hr			
	Transient		Nine-Mode	
Engine	2	4	2	4
HC	12.0	12.0	25.6	27.1
CO	164.	159.	151.	167.
NO_x	8.4	7.8	9.7	8.7
Fuel	402.	370.	431.	423.

TABLE 3. SUMMARY OF HC AND CO BASELINE TEST RESULTS

Engine	Make & CID	Test[a]	Emissions and Fuel, g/kW-hr			
			HC	CO	NO_x	Fuel
2	IHC 304	Tran.[b]	12.0	164	8.4	402
2	IHC 304	N-M	25.6	151	9.7	431
3	IHC 345	Tran.[b]	9.4	125	10.2	387
3	IHC 345	N-M	9.5	87	12.4	413
4	IHC 304	Tran.[b]	12.0	159	7.8	370
4	IHC 304	N-M	27.1	167	8.7	423
5	Chev. 366	Tran.	14.7	256	4.4	453
5	Chev. 366	N-M	17.1	230	4.7	457
9[c]	Chev. 366	Tran.	11.4	181	6.2	403
9[c]	Chev. 366	N-M	17.4	275	3.4	500
13	Ford 360	Tran.	8.2	132	7.0	382
13	Ford 360	N-M	14.8	76	7.1	447

[a]Tran. = Transient N-M = Nine-Mode
[b]With these engines, cycle speed above 100 percent were set to 100 percent.
[c]Retest of engine previously tested as Engine 5.

Engine 3 - This was the only engine tested both before and after tune-up. Results of these tests are as follows:

	Values in g/kW-hr			
	Transient		Nine-Mode	
	Pre-tune	Post-tune	Pre-tune	Post-tune
HC	9.3	9.4	11.6	9.5
CO	111.	125.	93.	87.
NO_x	12.3	10.2	12.4	12.4
Fuel	---	387.	390.	413.

Engines 5 and 9 - Engine 5 was retested as Engine 9, after it had been shipped to the EPA and returned. It should be noted that the compression pressures varied greatly between cylinders. In the transient tests, a decrease was noted in HC, CO, and fuel consumption, and an increase in NO_x. Results of these tests are summarized as follows:

	Values in g/kW-hr			
	Transient		Nine-Mode	
	Eng. 5	Eng. 9	Eng. 5	Eng. 9
HC	14.7	11.4	17.1	17.4
CO	256.	181.	230.	275.
NO_x	7.8	6.2	4.7	3.4
Fuel	370.	403.	457.	500.

VII. NO_x BASELINE TESTING

The NO_x baseline testing involved 1972 and 1973 heavy-duty gasoline engines. Emissions were evaluated in transient, nine-mode and idle tests. Results of the NO_x baseline testing are given in Appendices C, D and E.

A. Engines Tested

Nine different 1972 and 1973 heavy-duty gasoline engines were tested in the NO_x baseline phase of this project. The engines, and the heavy-duty vehicles from which they were removed, are identified in Table 4. Included are one or more engines from each of the five major domestic heavy-duty gasoline engine manufacturers.

Engine 22 was a tuned-up version of the engine which had previously been evaluated as Engine 11. Engine 21 had been removed from a vehicle prior to the shipment of the engine to this laboratory. No readable serial numbers were located on the two Ford engines, and with Engine 19 the sixth digit could have been either a 3 or an 8.

A 1973 Dodge 318 engine had been scheduled for testing as Engine 12. However, when installed on the test stand it was determined to be running very poorly. A compression test showed zero in one cylinder. Removing the cylinder head revealed that an exhaust valve had no head and that the corresponding piston had been damaged. The Project Officer directed that no further effort be expended on that engine.

The engines actually tested were all operable when received, but the overall initial condition of these engines varied greatly. Defects in the engines were generally detected during initial screening checks or during the more extensive examinations that were performed on each engine, subsequent to Engine 15. All significant engine repairs or modifications (i.e., replacement of a valve) were conducted under the specific directive of the EPA Project Officer, and his approval was obtained prior to the commencement of testing of each engine.

B. Engine Tune-Up and Maintenance

Tune-up of each engine involved replacement and/or adjustment of spark plugs, ignition wires, thermostat, distributor cap, points, rotor, condenser, PCV valve, air filter, fuel filter, oil filter and oil. Other adjustments or examinations included: ignition timing, valve clearances, cylinder compression, and the distributor mechanical and vacuum advance curves. As directed by the EPA Project Officer, carburetor idle mixture adjustment was incorporated after Engine 15, and cylinder power balancing and/or other evaluations

TABLE 4. 1972 AND 1973 NO_x BASELINE ENGINES TESTED

Engine Number [a]	Engine Description			
	Model Year	Make	CID	Serial Number
14	1972	Ford	361	---
15	1972	Dodge	413	J413TH
16	1973	Chevrolet	454	T0608TRC
17	1973	GMC	427	T1113AHT
18	1972	Chevrolet	350	V0210TLX
19	1972[b]	IHC	345	1099236V315E
20	1973	Ford	300	---
21	1973	IHC	304	107287V304A
22[c]	1973	GMC	366	T0818T0A

Engine Number	Heavy-Duty Vehicle Description		
	Model Year	Make	Serial Number
14	1972	Ford	F60ECP53814
15	1973	Dodge	M39BN35060736
16	1973	Chevrolet	CPZ373V320634
17	1973	GMC	TCE66TV570537
18	1972	Chevrolet	CPE322F150073
19	1973	IHC	106620H352956
20	1972	Ford	F60BCN42126
21	--	--	---
22	1973	GMC	TCE61TV603311

[a] Evaluations were intiated on Engine 12, a 1973 Dodge 318, but were discontinued when mechanical condition of this engine was found to be unacceptable.

[b] No apparent change between the 1972 and the 1973 model year.

[c] Engine 22 was initially tested as Engine 11.

were conducted when justified by the results of the tune-up or the other examinations.

More extensive examination of the engines was incorporated into this project during conductance of the NO_x baseline evaluations starting with Engine 16. Modified tune-up data sheets were incorporated with Engine 19. In addition, more extensive component checks were conducted to assure that the engines were representative of their respective model year and more extensive engine repairs were performed. All decisions, concerning significant engine repair or parts replacement and concerning acceptance of an engine for testing, were made by the EPA Project Officer. The tune-up data sheets are included in Appendix E and a selected summary of the tune-ups and the maintenance performed on the engines is given in Table 5.

Through Engine 15, tune-ups were conducted but major maintenance was generally not permitted. The tune-up and maintenance performed on each engine, subsequent to Engine 14, is briefly described as follows:

Engine 15 - A couple of minor difficulties were encountered with the 1972 Dodge 318 engine. The fuel pump sprung a leak after the first test and was replaced. The carburetor secondaries did not function smoothly, even after applying WD-40 to the linkage and bearing surfaces.

Engine 16 - The 1973 Chevrolet 454 was found to have a bad valve in Cylinder 6. This valve was replaced at the request of the Project Officer. During installation of the engine on the stand, it was determined that the left exhaust manifold was warped. It was also noticed that the manifold included air injection tubes. GM was contacted and from the carburetor and distributor numbers determined that this was a California engine with the air-pump missing. The engine was converted to "Federal" by changing the carburetor, intake manifold, and distributor.

The replacement distributor obtained had the right model number but had the wrong advance curve. Upon checking in the Motor Truck and Diesel Repair Manual, it was determined that the 1973 and 1974 models of this engine used the same distributor, but with different advance curves. Several additional distributors were obtained locally, but all of them met the 1974 advance curve specifications. The solution applied was to replace the weights with ones giving an acceptable advance curve.

The components, as-received and as subsequently tested, are identified as follows:

	As-Received	As-Tested
Distributor	1112105	1112113
Carburetor	7043507	7043207
Intake Manifold	330856	333839
Exhaust Manifold	With Air Tubes	Air Tubes Removed

In addition to replacing the intake valve on Cylinder Number 6, the valve seals were replaced on Cylinders 2, 4, 6, and 8. The cylinder compression

TABLE 5. NO_x BASELINE ENGINE TUNE-UP AND MAINTENANCE

Engine Number	Year	Make	CID	Compression Specs.	Compression As Tested	Problems Encountered and Maintenance Performed
14	1972	Ford	361	--	80-120	
15	1972	Dodge	413	100-140	100-110	Carburetor secondaries did not function smoothly, even after lubrication. Fuel pump leaked and was replaced.
16	1973	Chev.	454	20 Var.	130-145	A leaky valve in Cylinder 6 was replaced. Replaced carburetor, intake maniford and distributor to convert engine from California to Federal configuration. Distributor with correct advance curve could not be obtained, so the curve had to be shaped.
17	1973	GMC	427	80%	100-125	Intake valve and seals replaced and exhaust valve reseated in Cylinder 5. Governor was replaced. Added three quarts of engine oil during the evaluations.
18	1972	Chev.	350	80%	125-150	Throttle shaft bushing was significantly worn. Slight valve clatter on the left side of the engine, carburetor secondaries would open abruptly.
19	1972	IHC	345	--	115-125	Carburetor was not correct model and was replaced.
20	1972	Ford	300	75%	115-135	Engine as received did not have an air cleaner or a thermostat and the carburetor and distributor were not the correct model numbers. These items were installed or replaced as required. All valves were reseated, water pump and starter were defective and were replaced. The idle mixture spring on the carburetor was collapsed and was subsequently reworked.
21	1973	IHC	304	--	125-135	Upon receipt there was a carburetor fuel leak and the idle mixture could not be adjusted. Repairs were made by overhauling the carburetor. The bowl gasket and an o-ring were found to be faulty. Idle fuel mixture adjustment was extremely sensitive on this engine.
22	1973	GMC	366	80%	115-135	Governor did not function and was replaced. Accelerator pump was repaired. Cylinders 4 and 7 were "off balance" based on the General Motors cylinder balance test.

pressures were as follows:

	Compression Pressures, gage reading		
Cylinder	Dry	Wet	Repaired
1	120	140	120
3	120	130	120
5	125	135	125
7	125	140	120
2	130	145	135
4	115	140	125
6	90	95	125
8	115	140	120

After replacement of the intake valve in Cylinder 6, the compression pressures ranged from 120 to 135 with an average of 125. The specification given in the Service Manual was 150 with the lowest to be within 20 of the highest. The compression in this engine did not quite meet the specification in the Service Manual, but was well within the usual in-service requirement that the lowest be within 75 or 80 percent of the highest value.

Engine 17 - With the 1972 GMC 427 engine, the intake valve was replaced and the exhaust valve was reseated on Cylinder Number 5 prior to the removal of this engine from the truck. The compression pressures were as follows:

	Compression Pressures, gage reading		
Cylinder	Dry	Wet	Repaired
1	110	125	110
3	105	120	100
5	85	85	125
7	110	110	100
2	115	120	110
4	110	105	100
6	120	135	110
8	125	135	120

After replacing the intake valve in Cylinder Number 5, the compression pressures were within the requirement that the lowest reading be within 80 percent of the highest.

Upon receipt of the truck, the lubricant level in the engine was about two quarts below the full mark on the dipstick. During the course of the engine set-up and emissions testing, a total of three quarts of oil were added to the engine. There was no noticeable lubricant leakage from the engine. Exhaust smoke, during prolonged cut-throttle operation with this engine, was relatively severe. This condition, which primarily occurred during the nine-mode test, possibly accounts for a major part of the oil consumption.

The governor circuit in the distributor, and the governor itself, were not functioning on the engine as received. Therefore, the distributor and governor were replaced with operable units having the same part numbers.

The idle mixture was set using the specified 50 rpm lean-drop method. The resultant CO level at 550 rpm was between 1.0 and 1.5 percent. This was also determined to be the lowest CO level achievable with reasonably acceptable idle.

Engine 18 - The 1972 Chevrolet engine required no rework and no replacement of major components. The compression pressures ranged from 125 to 150 with an average of 135. The specification given in the Service Manual was 150 with the lowest to be within 20 of the highest. The compression in this engine almost met the specification in the Service Manual and was well within the usual in-service requirement that the lowest be within 75 or 80 percent of the highest value.

This engine did have a worn throttle bushing, but this did not appear to have any serious effects. This worn bushing, however, may have been responsible for the variations in the emissions values measured in the idle tests.

Engine 19 - With the 1972 International 345, it was determined that the Holley 151786-R94 carburetor was not the correct unit. A manufacturer's representative was contacted, and one of the carburetor models recommended was obtained. The carburetor obtained for use with this IHC 345 was a 454578-C91. The measured compression ratio values ranged from 115 to 125.

Engine 20 - With the 1972 Ford 300 engine, the initial compression values ranged from 80 to 120. Indications were that this cylinder head had previously had one or more valve jobs performed on it, based on the appearance of the valves and the recess in the head. The EPA Project Officer directed that minimum rework be performed and then to recheck the compression. After seating of the valves, the compression values ranged from 115 to 135 and met the requirement that the lowest value be at least 75 percent of the highest.

This engine as received had a D3TF12127GA distributor and a YF64255 carburetor, and did not have an air cleaner. The carburetor was replaced with a D2TZ9510-AA carburetor replacement kit (Carburetor tag was Motorcraft D2HF KA) obtained through the EPA Project Officer. The distributor, apparently a 1973 model, was replaced with a rebuilt unit C9TZ-12127-FRM (C6TF-12127-AG on the distributor) which was obtained locally from a Ford dealer. This replacement distributor had the appropriate mechanical advance curve, but required rework of the vacuum advance unit to obtain the specified vacuum advance curve. An air cleaner was obtained and installed onto the engine.

With this engine, it was very difficult to assure the correctness of replacement components (carburetor and distributor) and some of the tune-up requirements (idle mixture adjustment) from available written sources (the manufacturer's shop manual or the Motor Repair Manual). In all cases, final pre-test acceptance was based on verbal approval from the EPA Project Officer.

Engine 21 - With the 1973 IHC 304 engine, there was a significant external fuel leak from the carburetor bowl and the idle-mixture could not be adjusted to obtain a CO value below several percent. The external leak was

found to be due to a faulty bowl gasket and an internal leak was due to a faulty O-ring. A replacement carburetor was not available so the existing carburetor was overhauled. This problem with the carburetor was the only difficulty of significance that was experienced with the IHC 304 engine. One item of possible interest, however, was a relatively large change in idle CO levels with small changes in the setting of the idle mixture screws (i.e, less than one-eighth of a turn would change idle CO from 0.6% to 1.2%). This made the setting and retaining of the specified CO percent somewhat difficult with this engine.

Engine 22 - The 1973 GMC 366 engine, previously tested as Engine 11, was retested as Engine 22. There were questions concerning the NO_x emissions values that were originally obtained when this engine was tested as Engine 11. This engine was treated as though no previous tests had been conducted and underwent all current test and pre-test requirements.

In the tune-up, the only adjustable parameter found to be out of specification was the idle mixture. It should be noted that, at the time Engine 11 was evaluated, adjustment of the idle mixture was not permitted.

Testing was then initiated with this engine. The operation of the engine during the initial testing indicated the accelerator pump was not functioning. It was found that the check-ball in the accelerator pump chamber was laying loose in the chamber. The accelerator pump was repaired and the testing was resumed.

Following the evaluations with this engine, several additional engine diagnostic tests were conducted. The results are briefly summarized as follows:

Cylinder	Cylinder Compression	Leak[a] Down	Cylinder[b] Balance	RPM[d] Drop	Carb. [e] Balance
1	130	8	A600	65	X1120
2	130	8	B665	75	Y1045
3	120	26	B665	70	Y1045
4	120	14	C000[c]	45	X1120
5	125	11	D660	75	Y1045
6	125	15	A600	55	X1120
7	130	10	C000[c]	75	X1120
8	125	10	D660	70	Y1045

[a] Using a Sun Leak-Down Tester
[b] With six cylinders grounded from initial 1500 rpm
[c] Engine died
[d] With one cylinder grounded from initial 1500 rpm
[e] With four cylinders grounded from initial 1500 rpm

These data indicate that cylinder four was a weak cylinder. An additional check showed that all valves had approximately the same amount of lift. A rather severe knocking developed in the left side of the engine, and diagnostic evaluations were discontinued with this engine.

C. Emissions Test Results

Summaries of the emissions test results are given in Appendix C and copies of the computer printouts are given in Appendix D. Brief summaries of results are presented in this section of the report.

1. Transient and Nine-Mode Emissions

The transient and nine-mode emissions results are summarized in Table 6. These data show that, for the overall average, the HC, NO_x and fuel consumption were somewhat lower for the transient tests than for the nine-mode tests, and power was somewhat higher. The CO emissions, however, were over twice as high in the transient tests as in the nine-mode tests. Inclusion of these data into the baseline was conducted by the EPA, as reported in the EPA technical report, "1972-73 Heavy-Duty Engine Baseline Program and NO_x Emission Standard Development."(3)

2. Methane Emissions

The average methane emissions for the transient evaluations are summarized as follows:

	Emissions, g/kW-hr		Percent of Total HC	
Engine	Total HC	Methane	Methane	Non-Methane
17	8.0	0.50	6	94
18	5.4	0.37	7	93
19	6.4	0.43	7	93
20	10.1	0.40	4	96
21	5.5	0.34	6	94
22	7.8	0.60	8	92
Avg.	7.2	0.44	6	94

The methane, as a percent of the total hydrocarbons in the exhaust, ranged from 4 to 8 percent; with an overall average of 6 percent.

3. Idle Emissions

Initially, the HC and CO emissions were measured using a garage-type analyzer, and NO_x was measured using the nine-mode emissions cart. With Engines 14 and 15, HC and CO at idle were also determined using dilute bag samples. Subsequent to Engine 15, measurement of NO_x at idle was discontinued and the HC, CO and CO_2 emissions were determined using a dilute bag sample. CO_2 was also measured in the undiluted exhaust, and the dilute HC and CO emission concentrations were adjusted, to an undiluted exhaust basis, using the ratio of the undiluted to diluted concentrations of CO_2. The results of the emissions results are summarized in Table 7. These data show that the two engines that produced the highest HC at idle (Engines 17 and 20), also produced high HC emissions in the transient tests. In general, however, there did not appear to be any direct relationship between emissions at idle and in the transient test. This is best illustrated for HC by the average data for Engines 16 and 18 and for Engines 19 and 21. Engines 16 and 18

TABLE 6. SUMMARY OF NO_x BASELINE TEST RESULTS

Engine	Make & CID	Test[a]	Emissions and Fuel, g/kW-hr					Power kW
			HC	CO	NO_x	CO_2	Fuel	
14	Ford 361	Tran.	14.7	216	6.2	937	417	23.4
14	Ford 361	N-M	10.9	120	8.6	989	415	21.4
15	Dodge 413	Tran.	9.5	212	7.2	982	424	26.9
15	Dodge 413	N-M	10.7	71	9.3	1132	423	23.1
16	Chev. 454	Tran.	3.9	100	6.1	1160	420	27.5
16	Chev. 454	N-M	6.7	31	6.0	1292	461	22.0
17	GMC 427	Tran.	8.0	68	10.9	1038	369	28.4
17	GMC 427	N-M	10.6	47	9.8	1060	387	25.6
18	Chev. 350	Tran.	5.1	108	8.4	901	343	24.7
18	Chev. 350	N-M	9.0	44	9.7	1004	374	20.1
19	IHC 345	Tran.	6.4	151	6.5	846	347	26.9
19	IHC 345	N-M	8.4	46	9.2	956	390	20.3
20	Ford 300	Tran.	10.1	95	11.6	935	352	19.4
20	Ford 300	N-M	9.9	43	11.7	1030	374	16.7
21	IHC 304	Tran.	5.5	115	7.9	934	357	23.0
21	IHC 204	N-M	9.2	75	8.8	994	405	18.0
22	GMC 366	Tran.	7.8	175	6.4	984	405	25.2
22	GMC 366	N-M	8.6	132	5.6	1008	397	21.6
Average of Tran/N-M in %			83	225	91	92	95	120
Minimum Tran/N-M in %			57	133	71	87	88	109
Maximum Tran/N-M in %			135	328	114	98	102	133

[a] Tran. = Transient N-M = Nine-Mode

TABLE 7. SUMMARY OF IDLE HC AND CO EMISSIONS

	Emissions					
	Idle		Idle : Transient		Transient Cycle, g/kW-hr	
Engine	HC, ppmC	CO, %	HC	CO	HC	CO
14	--	--	--	--	14.7	216
15	--	--	--	--	9.5	212
16	5097	0.9	1300	0.01	3.9	100
17	7700	2.7	1000	0.04	8.0	68
18	4200	2.3	800	0.02	5.1	108
19	2100	1.4	300	0.01	6.4	151
20	17900	3.9	1800	0.04	10.1	95
21	1600	0.3	300	0.00	5.5	115
22	4900	1.0	600	0.01	7.8	175
16,17&20	10000	--	1400	--	7.3	--
18,19&21	2600	--	500	--	5.7	--
16&18	4600	--	1000	--	4.5	--
19&21	1900	--	300	--	6.0	--
17&20	--	3.3	--	0.04	--	82
16&21	--	0.6	--	<0.01	--	108

produced about 2.5 times as much HC in the idle tests as produced by Engines 19 and 21, but only 75% as much in the transient tests. The lack of correlation for the CO emissions is best illustrated by the average data for Engines 17 and 20 and for Engines 16 and 21.

With Engine 20, the HC emissions at idle could be considered to be excessively high. The specific cause for the high HC emissions was not determined. The mechanical condition of this engine was discussed in the preceeding Section VII B.

4. Findings With Specific Engines

Several findings with a number of the engines were of interest and assist in understanding some of the results obtained. The findings are briefly discussed as follows:

Engine Power and Torque - With the 1972 model gasoline engines, the manufacturer's rated torque and horsepower do not appear to be directly related to the actual available power from the engine. Therefore, the manufacturer's rated power for 1972 model engines generally does not help in determining whether an engine is operating properly. An approximation which had been developed from a Chevrolet 350 engine and used in a couple of previous projects is as follows:

$$\text{Maximum Power} = 0.000116 \times \text{CID} \times \text{Rated RPM}$$
$$\text{Maximum Torque} = 0.715 \times \text{CID}$$

The power values for Engine 20, a 1972 Ford 300 engine, were as follows:

	Mfg. Rated	Measured	Approximation
Power	165 @ 3600	118 @ 3400	125 @ 3600
Torque	294	220	215

The measured values were less than 75 percent of the manufacturer's rated values, but did not differ much from the approximation. Therefore, it appears that this engine had a reasonable power output.

Manual Choke Operation - In keeping with the procedure prescribed by the EPA Project Officer, the choke was opened and remained open after the automatic cycle control system was engaged. With this method, there was some noticeable engine hesitation during the first several accelerations.

Engine 18 - The 1972 Chevrolet 350 engine has a four-barrel carburetor, and, when the secondaries came in, the immediate effects were dramatic. For example, with steady increase in throttle at 2500 rpm, the torque would increase in direct relation to the throttle setting until a point was reached at which the torque would suddenly double in value. This point was that at which the secondaries began to open. This condition initially made it difficult to meet the cycle parameters. However, by appropriate adjustment of the system gain control, acceptable cycle parameter values were attained. The gain setting was different for transient cycle Tests 18-1 and 18-3. The composite results for these tests, however, were in very good agreement.

Engine 20 - With the 1972 Ford 300 engine, a malfunction occurred which resulted in some potentially interesting results. The idle mixture, as initially adjusted, produced about 3 percent CO. From the emissions results during the initial testing, however, it became apparent that some change had occurred. It was found that the spring on the idle mixture adjusting screw was collapsed; allowing vibration to change the mixture setting. Based on a measured CO value of about 0.2 percent, the adjusting screw had apparently vibrated to a very lean position. The first two transient tests (20-1 and 20-2) had apparently been run at that condition. Tests 20-3 and 20-4 were then run after readjusting the idle mixture. The results of these tests are summarized as follows:

	Average Values						
	Lean-Cold	Test Hot	20-1 & -2 Composite	Tuned-Cold	Test Hot	20-1 & -2 Composite	Lean-Tuned/Tuned, in %
HC, g/kW-hr	16.1	12.0	12.6	14.5	9.3	10.1	+25%
CO, g/kW-hr	96.	76.	79.	110.	93.	95.	-17%
CO_2, g/kW-hr	960.	911.	918.	944.	934.	935.	-2%
NO_x, g/kW-hr	8.6	10.9	10.5	10.6	11.8	11.6	-9%
SFC, kw/kW-hr	0.37	0.34	0.34	0.37	0.35	0.35	-3%
WORK, kW-hr	6.4	6.3	6.3	6.4	6.3	6.3	0%
POWER, kW	19.6	19.5	19.5	19.5	19.4	19.4	+1%
IDLE CO, %	----	≈0.2	----	----	≈3.5	----	----

The very lean mixture condition produced 25 percent higher HC and 17 percent lower CO than was produced with the tuned-up idle mixture condition. The NO_x value, however, was reduced by only 9 percent at the lean mixture condition relative to the tuned-up condition.

The NO_x values per bag, for the hot transient, were as follows:

	NO_x in Grams for the Hot Transient				
Bag	1	2	3	4	Total
Lean	3	13±1	48±3	5	69
Tuned	5	15	49±4	5	74
L-T	-2	-2	-1	0	-5

These data illustrate that Bag 3 is the major contributor to the total NO_x (about two-thirds of the total). These data further illustrate that the major contributors to the NO_x composite test differences were Bags 1 and 2 of the hot transient (about 80 percent of the total differences). Not shown is that the HC emission rates for Bag 3 were essentially unchanged for the lean and tuned conditions.

Bag 3 primarily involves significant speed and load operating conditions. Therefore, it appears that idle mixture adjustment has minimal effect at significant speed and load operating conditions, and as a result has

relatively minor effect on total composite NO_x emission rates.

Engine 22 - The 1973 GMC 366 engine was initially evaluated as Engine 11. Due to concerns over the NO_x emission rates, this engine was subjected to an extensive tune-up and was retested as Engine 22. Problems were encountered with the accelerator pump, in an initial check-out run, and these problems were resolved.

Following repair of the accelerator pump, two runs were conducted that did not meet the specified cycle statistics. This was found to be associated with the fact that this was a relatively high-speed, governed engine. The procedure required that all speeds higher than the governed speed be attained by motoring the engine. The dynamometer used in this project, however, had a maximum motoring speed of 3500 rpm. Therefore, motored speeds above 3500 rpm were unattainable, and this had a significant effect on the speed standard error and intercept. This deviation in motored speed, however, was previously found to have a negligible effect on emissions. By careful adjustment of the controls, it was possible to obtain statistics meeting the requirements.

The results of the various evaluations conducted with this engine are summarized as follows:

	Transient			Nine-Mode	
Engine Number	11[a]	22[b]	22	11[a]	22
HC, g/kW-hr	15.0	9.3	7.8	14.7	8.6
CO, g/kW-hr	230.	193.	175.	185.	132.
NO_x, g/kW-hr	3.7	6.2	6.4	5.5	5.6
SFC, kg/kW-hr	0.42	0.42	0.41	0.44	0.40

[a] Idle mixture set very lean and the accelerator pump was probably not functioning.

[b] Accelerator pump was not functioning (Test 22-00).

Indications are that the large difference in HC emissions, between configuration 11 and 22, was due to the very lean idle mixture setting. The reason for the large difference in NO_x emissions was not apparent.

VIII. NEW CURRENT TECHNOLOGY ENGINES

Three different 1978 and 1979 engines were tested for purposes of correlation with the Environmental Protection Agency. One of the three engines was tested three different times. Emissions are reported for transient and nine-mode tests.

A. Engines Tested

Three 1978 and 1979 engines were evaluated for the purpose of correlation with data generated on the same engines by the EPA. All of these engines were provided to this laboratory in crates and were designated as being ready for testing. All preparations on these engines, other than minor tune-up, were conducted prior to shipment to this laboratory.

On these three engines, the idle speed, idle mixture, ignition timing, and dwell were checked, and were adjusted to manufacturer's specifications when necessary. These engines are identified in Table 8.

TABLE 8. NEW 1978 AND 1979 ENGINES TESTED

Engine Number	Engine Description			
	Model Year	Make	CID	Serial Number
1[a]	1978	IHC	404	404-053483
6[a]	1978	IHC	404	404-053483
7	1978	Chevrolet	454	T364776
8[a]	1978	IHC	404	404-053483
10	1979	GMC	292	---

[a] Engines 6 & 8 are retests of Engine 1.

B. Emissions Test Results

Summaries of the emissions test results and copies of the computer printouts are given in Appendix F. Brief summaries of the results are given in Table 9.

An item of interest in these data is the significantly lower HC emissions in the nine-mode tests, relative to the transient tests. With the older engines evaluated in this project, the HC emissions in the nine-mode tests were generally equal to or greater than the HC emissions in the transient tests.

The IHC 404 engine was evaluated at three different times as part of a program to establish correlation between results obtained by this laboratory and the EPA. Engine test designations for these evaluations were Engine 1, 6 and 8. The minimum, average and maximum values for these three evaluations are included in Table 9.

TABLE 9. SUMMARY OF THE NEW ENGINE TEST RESULTS

Engine	Make & CID	Test[a]	Transient Test Emissions and Fuel, g/kW-hr HC	CO	NO_x	Fuel
1[b]	IHC 404	Tran.	4.0	96	7.6	414
		N-M	1.8	45	7.1	460
6[b]	IHC 404	Tran.	6.0	103	8.5	398
		N-M	1.6	42	8.5	390
7	CHEV. 454	Tran.	3.3	68	8.7	371
		N-M	0.8	27	7.8	394
8[b]	IHC 404	Tran.	5.1	78	6.7	385
		N-M	1.5	20	5.3	418
10	GMC 292	Tran.	12.6	122	17.8	385
		N-M	5.4	67	17.7	424
Avg. of Engine 1, 6, 8		Tran.	5.0	92	7.6	399
Min. of Engine 1, 6, 8		Tran.	4.0	78	6.7	385
Max. of Engine 1, 6, 8		Tran.	6.1	103	8.5	414
Avg. of Engine 1, 6, 8[b]		N-M	1.6	36	7.0	422
Min. of Engine 1, 6, 8[b]		N-M	1.5	20	5.3	390
Max. of Engine 1, 6, 8[b]		N-M	1.8	45	8.5	460
Avg. of Tran/N-Min %[c]			320	230	107	93
Min. of Tran/N-Min %			230	180	101	91
Max. of Tran/N-Min %			410	260	111	95

[a]Tran. = Transient N-M = Nine-Mode
[b]Engines 6 & 8 are retests of engine 1.
[c]Average of the percentage for each engine.

LIST OF REFERENCES

1. Federal Register, Vol. 44, No. 31, Tuesday, February 13, 1979.
   Note: The above proposed rules for heavy-duty emissions regulations, with some modifications, were subsequently issued as Subpart N to Part 86 in the Federal Register, Monday, January 21, 1980.

2. Cox, Timothy P., Glenn W. Passavant and Larry D. Ragsdale, "1969 Heavy-Duty Engine Baseline Program and 1983 Emissions Standards Development." Technical Report, Office of Air, Noise and Radiation, U.S. Environmental Protection Agency, Ann Arbor, May 1979.

3. Cox, Timothy et al, "1972-73 Heavy-Duty Engine Baseline Program and NO_x Emission Standard Development." Technical Report No. EPA-AA, SDSB-81-01. March 1981.

4. Telephone conversation between Sherrill Martin and Richard Burgeson on December 13, 1978.

5. Code of Federal Regulations, Title 40, Chapter 1, Part 85, Subpart H.

6. Federal Register, Vol. 42, No. 174, Thursday, September 8, 1977.

7. Memorandum from Charles Urban and Harry Dietzmann that was transmitted to the EPA on August 10, 1979.

8. Telephone conversation between Sherrill Martin and Timothy Cox on September 5, 1979.

APPENDICES

A - General Information
B - HC and CO Baseline Test Results
C - NO_x Baseline Test Results
D - NO_x Baseline Data Computer Printouts
E - NO_x Baseline Engine Tune-up Record Sheets
F - Test Results On New Engines

APPENDIX A

GENERAL INFORMATION

A-1 - Revised Scope of Work
A-2 - Original Scope of Work
A-3 - CVS Nine-Mode Test Procedure
A-4 - Program TCP for Determination
of Test Acceptability

APPENDIX A-1. REVISED SCOPE OF WORK

Contract No. 68-03-2603

Exhibit A

Scope of Work

The contractor shall test gasoline and diesel-type heavy-duty engines by the test procedures authorized below. The engines will be supplied by EPA.

A minimum of 22 gasoline engines and a minimum of 23 diesel engines shall be tested. In lieu of engines, up to 20 vehicles may be supplied by EPA. The contractor shall remove, test, and replace the engines. Vehicles shall be returned in the same general condition as received.

The Test Procedures, Equipment Specifications, and Calibration Procedures are outlined below. The detailed procedures shall be found in: Title 40 of the Code of Federal Regulations, Part 86, Subpart D, "For 1979 and Later Model Year Heavy-Duty Engines", as published in the Federal Register, September 8, 1977, pp. 45154 - 45174; revised Title 40 of the Code of Federal Regulations, Part 86, Subpart P and N, "For 1984 and Later Model Year Heavy-Duty Engines", as published in the Federal Register, January 21, 1980, pp. 4136 - 4227; and "Draft Recommended Practice for Measurement of Gaseous and Particulate Emissions from Heavy-Duty Diesel Engines Under Transient Conditions", EPA Technical Report No. SDSB-79-18, by E. Danielson, April 1979. Deviations from the procedures referenced above, substitution of additional procedures within the scope of technical direction, or substitution of procedures which supersede those procedures referenced above, shall be made only with prior approval of the EPA Project Officer.

I. Test Procedure

1. Receipt of Engine

a. The EPA Project Officer shall specify which engines are to be tested.

b. Engines will be furnished by EPA to the test facility. The contractor shall examine the engines for damage during shipment and will verify that the engine delivered is the same as specified by the EPA Project Officer. EPA will ensure that the contractor, at any time, has at least one engine on hand for testing until the total quantity of engines has been tested.

2. Engine Adjustment

a. All new engines shall be checked to determine:

1) Idle speed;

2) Rated power;

3) Rated speed;

4) Rated torque.

These checks shall be made with the engine warmed up. If the items checked are outside of the recommended specifications, the EPA Project Officer shall be notified. Subsequent action may include troubleshooting, engine adjustment, and mechanical repair.

b. All in-use engines shall be checked for operational integrity using procedures specified by the EPA Project Officer. These checks shall include, at a minimum:

1) Visual inspection, including verification that the carburetor and distributor are the proper parts for the engine being tested;

2) Cylinder compression check (warm).

The criteria against which the engine's integrity shall be checked shall be specified by the EPA Project Officer, who shall be notified if the engine fails checkout, and who shall direct any subsequent action. Subsequent action may include mechanical repair or engine rejection.

c. Following initial checkout, all in-use engines shall be subjected to major tune-up. What constitutes a major tune-up shall be prescribed by the EPA Project Officer, as will guidance and assistance should tune-up specifications be unattainable. Major tune-ups may require at a minimum:

1) Replacement and/or adjustment of ignition-related parts;

2) Possible mechanical repair;

3) Recording of "recommended" and "as-tune" specifications in a format to be specified by the EPA Project Officer.

3. Steady-State Emission Testing

a. Following engine checkout and any required adjustments, all engines shall be tested per Title 40 of the Code of Federal Regulations, Part 86, Subpart D, using a modified version of the "9-mode" Test Procedure for Gasoline Engines, or the "13-mode" Test Procedure for Diesel Engines.

b. A total of two (2) complete tests are required with a third test recommended if emission results from the first two tests are inexplicably variable.

c. These steady-state tests may, at the discretion of the contractor and the EPA Project Officer, serve as further checks on engine integrity, over and above those specified above.

4. Transient Emission Testing

a. Transient emission testing shall be conducted and validated per Title 40 of the Code of Federal Regulations, Part 86, Subpart N. In summary, such testing shall consist of:

1) Generation of maximum torque curve (mapping);

2) Generation of the transient reference cycle;

3) Pre-test engine soak or cool down;

4) Cold-start transient cycle, lasting approximately twenty (20) minutes during which emissions are sampled;

5) A twenty (20) minute soak with the engine off;

6) Hot-start transient cycle, lasting approximately twenty (20) minutes, during which emissions are sampled;

7) Emission calculations and test cycle validation.

b. A total of two (2) complete and valid tests are required, with a third test recommended if emission results from the first two are inexplicably variable. Generation of an engine map and the reference cycle need only be done once per engine, however.

5. Additional Testing

a. Limited additional testing for both research purposes and for checks on engine integrity may be required at the direction of the EPA Project Officer. Such additional testing may include idle emission tests, emission testing over alternate transient cycles, and the sampling of additional gases and exhaust matter during the standard tests.

6. Release of Engine

a. Upon completion of testing the contractor shall notify the EPA Project Officer for approval to discontinue testing. After such approval is given, the Project Officer will arrange to assume custody within a reasonable time.

II. Specifications and Equipment Requirements

1. Test Cycle

a. The test cycle is defined in terms of "normalized" speed and power. For speed, 0% indicates idle rpm and 100% is usually the manufacturers rated rpm for maximum power. For torque, 0% is no torque and 100% is the maximum torque which the engine can produce at a given engine speed. Other values are linearly related to the two set points. Negative values indicate an engine speed below idle or a motoring condition.

b. The test cycle is defined by a curve through the specified speed and torque sequences.

2. Dynamometer and Engine Equipment

a. The dynamometer shall be capable of performing the test cycle within the specified tolerances. The engine cooling system shall maintain (approximately) the manufacturers specified operating temperature.

b. Engine speed and torque shall be continuously recorded. In addition, the deviation from the test cycle shall also be shown to verify test validity.

3. Exhaust Gas Sampling System and Analyzers

a. The sampling system and gas analyzer shall conform to the specifications found in the appropriate Subparts of Title 40 of the Code of Federal Regulations, Part 86, or as specified by the EPA Project Officer.

4. Analytical Gasses, Fuel, Calibration Procedure

a. The analytical gases, fuels, and calibration procedures shall conform to the specifications found in the appropriate Subparts of Title 40 of the Code of Federal Regulations, Part 86, or as specified by the EPA Project Officer.

III. Additional Testing (Diesel Engines)

1. Particulates and Hydrocarbons

a. In addition to gaseous emission measurements, measurements of diesel particulate emissions shall be made during each transient emission test.

b. Both particulate and hydrocarbon measurements shall be made in accordance with "Draft Recommended Practice for Measurement of Gaseous and Particulate Emissions from Heavy-Duty Diesel Engines Under Transient Conditions," EPA Technical Report No. SDSB-79-18, by E. Danielson, April 1979, or as directed by the EPA Project Officer.

c. High-volume sampling of diesel particulates shall be made during all transient emission testing using equipment and procedure to be agreed upon between EPA and the contractor. High-volume particulate samples shall be stored in accordance with accepted scientific practice and shall be made available for distribution to outside laboratories.

2. Smoke

a. Continuous traces of exhaust opacity (approximately 6 inches/minute) shall be supplied for all transient diesel testing. An in-line smokemeter shall be used. Smokemeter malfunctions shall not void the exhaust emissions tests.

IV. Data Submission

1. Data Submission

a. Test results shall be submitted in two manners, packets and punched (and interpreted) 80-column cards. Formats for these submissions shall be specified by the EPA Project Officer.

b. Test results for each engine shall be submitted within a reasonable time after completion of each engine.

c. Strip charts and test notes shall be retained and submitted as requested by the Project Officer.

Exhibit A Contract No. 68-03-2603

Scope of Work
(8 Pages)

The contractor shall test gasoline and Diesel type heavy duty engines by the transient test procedure outlined below. A tentative list of engines appears as Table A-1. Seven gasoline and ten Diesel engines will be from in-use vehicles. The remaining engines will be in new, or nearly new condition.

A minimum of 25 engines of each type shall be tested. Each engine test will require development of an engine torque curve, a high and low speed idle emission check, and a Cold/Hot Start Transient Emission Test. One replicate of the transient test shall be run. In-use engines shall be tested first in "as-received" condition; a tune-up may be required followed by additional testing.

The detailed Test Procedures, Equipment Specifications and Calibration procedures follow. References have been made to EPA's Motor Vehicle Engine Test Procedure, Title 40 of the Code of Federal Regulations Part 86 (e.g., 40 CFR §86.XXX); and also to proposed 40 CFR Part 86, Subpart D for 1979 heavy duty engines; see 41 Federal Register 21292-21313, 24 May 1976.

I. Test Procedures

0. Overview: Figure 1 is a schematic of the test sequence. It shows the different test sequences for new and in-use engines. The items in these sequences, the equipment to be used and the calibration procedures to be followed are described below.

1. Receipt of engine:

(a) EPA will, for each engine, transmit a written test order to the contractor containing the engine description and necessary specifications.

(b) Engines will be furnished by EPA to the test facility. The contractor shall examine the engines for damage during shipment and will verify that the engine delivered is the same as specified in the test order. EPA will insure that the contractor, at any time, has at least one engine on hand for testing until the total quantity of engines has been tested.

2. Engine adjustment:

(a) All new engines, shall be checked to determine:

(1) Idle speed

(2) Idle CO exhaust concentration

(3) Timing (Gasoline engines only)

(4) Dwell (Gasoline engines only)

These checks shall be made with the engine warmed up.

(b) If the items checked are outside of the specifications on the test order, they shall be adjusted to fall within the specification range

3. Engine mapping

(a) Gasoline engines shall be warmed-up as follows:

(1) Idle - 1 minute

(2) 2000 rpm at 10% torque - 4 minutes

(3) 2000 rpm at 55% torque - 35 minutes

(b) Diesel engines shall be warmed-up by idling for 2 minutes and then by operating at rated speed, maximum power for 10 minutes.

(c) A curve of maximum torque versus speed shall be developed for engine speeds of -22% to +150% (percent speed is defined in the item on engine cycles). Readings will be taken from the lowest to highest speeds in 100 rpm increments. Duplicate readings are then taken going from highest to lowest speeds. The maximum torque curve is derived from the average of the two readings. If an engine will not develop any torque at a required speed, that reading is to be omitted.

4. Pre-test soak:

(a) The engine shall soak at an ambient temperature of 25C $\pm$5 for a period of 8 to 36 hours prior to the cold start test.

(b) If the engine soaks for more than 36 hours, it shall be warmed up, 3(a) or (b), and allowed to soak for 8 to 36 hours prior to the cold start test.

5. Cold start CVS test:

(a) The cold start CVS test is a continuous test consisting of 5 five minute segments in series. Exhaust mass emissions are determined separately for each segment. Engine start-up is included in the initial segment.

(b) All equipment is to be in a stand-by or operating mode prior to the start of the test.

(c) Start the engine, following the manufacturers procedure either using the engine starter or by operating the dynamometer at the engine cranking speed. Exhaust gas sampling is to begin when cranking starts.

(d) Once the engine starts, the operation cycle begins. The engine must be operated over the specified sequence of engine speed and torque, within the tolerances. See Item 11.

(e) At the end of each five minute segment, terminate the previous sampling and begin taking a new sample. Analyze sample bags as soon as possible, but in no case more than 20 minutes after the sample has been collected. Collect and calculate mass emissions in accordance with 40 CFR Part 86, Subpart B.

(f) At the end of the fifth sample collection period, stop sampling and then turn the engine off.

6. Pre-hot start soak: Allow the engine to soak for 15 minutes prior to the hot start test.

7. Hot start test: The hot start test consists of repeating the first segment of the cold start test. Sample collection includes engine starting but does not include engine shut down.

8. Idle test:

(a) Allow the engine to idle following the hot start test.

(b) Measure HC, CO and NOx in the undiluted exhaust with "gararge type" instruments. Also measure undiluted CO_2 using a "laboratory grade" analyzer.

(c) Simultaneously with the undiluted exhaust measurements, collect dilute exhaust and background samples using the CVS. Analyze for HC, CO, CO_2 and NOx.

(d) Increase engine speed to 2500 rpm ($\pm$ 100). If 2500 rpm cannot be obtained, then use maximum obtainable speed. Repeat the procedure in (b) and (c).

(e) Using the ratio of CO_2 undiluted/diluted calculate the undiluted concentrations of HC, CO and NOx from the CVS results.

9. Replication: Repeat items (4) through (8) to obtain a second set of test results. This completes the entire test sequence for new engines.

10. In-use engines; tune-ups:

(a) After running a replicate test on an in-use engine (in "as-received" condition) check the quantities listed in item 2 (a).

(b) If the quantities are within the test order specifications, testing of the in-use engine is complete.

(c) If the quantities are not within the tolerances on the order, proceed to adjust and/or tune-up the engine to meet the test order specifications. After the engine has been adjusted and/or tuned up, proceed with items 3 through 9 as if it were a new engine.

11. Release of engine: Upon completion of testing the contractor shall notify EPA. EPA will arrange to assume custody within a reasonable time.

II. Specifications and Equipment Requirements

12. Test Cycle:

(a) The test cycle is defined in terms of "normalized" speed and power. For speed, 0% indicates idle rpm and 100% is the manufacturers rated rpm for maximum power. For torque, 0% is no torque and 100% is the maximum torque which the engine can produce at a given engine speed. Other values are linearly related to the two set points. Negative values indicate an engine speed below idle or a motoring condition (which will be run with the throttle closed).

(b) The test cycle is defined by a curve through the specified speed and torque sequences.

The tolerances around each curve are defined as follows:

(1) Speed: The upper limit is 25 rpm higher than the highest point on the curve within 1 second of the given time. The lower limit is 25 rpm lower than the lowest point on the curve within 1 second of the given time. On speed accelerations, deviations of speed below the reference speed are acceptable if the engine is operated at WOT until the engine speed agrees with the reference speed.

(2) Torque: The upper limit is 5% or 30 ft-lbs (20 ft-lbs for gasoline engines), whichever is less, greater than the highest point on the curve within 1 second of the given time. The lower limit is 5% or 30 ft-lbs (20 ft-lbs for gasoline engines), whichever is less, lower than the lowest point on the curve within 1 second of the given time. The torque tolerances do not apply for conditions of decreasing torque with simultaneously decreasing speed for engine motoring.

(c) The test cycles will be provided to the contractor within one (1) month after the effective date of the contract.

13. Dynamometer and engine equipment:

(a) The dynamometer shall be capable of performing the test cycle withing the specified tolerances. The engine cooling system shall maintain (approximately) the manufacturers specified operating temperature.

(b) Engine speed and torque shall be continuously recorded to within $\pm$ 1% of the rated speed and maximum torque. In addition, the deviation from the test cycle shall also be shown to verify test validity.

14. Idle check equipment: "Garage type" instruments (Sun, EPA-75; and Teeco, Model 8A; or equivalents) shall be used to obtain idle readings. NDIR (Nondispersive infra-red) detection shall be used for HC and CO, chemiluminescent shall be used for NOx. The "laboratory grade" CO_2 analyzer shall conform to proposed 40 CFR §86.316-79.

15. Fuel: See proposed 40 CFR §86.307.

16. Analytical Gases: See proposed 40 CFR §86.308. Exception, the 0% O_2 oxygen interference check gas is not required.

17. Analyzers: See proposed 40 CFR §§86.316 to 86.318.

18. Exhaust gas sampling system: See 40 CFR §86.109. Flow rates may have to be increased to accommodate the quantities of exhaust gases generated.

19. Exhaust gas analytical system schematic: See 40 CFR §86.111, paragraph (a).

III. Calibrations

20. Calibrations: See proposed 40 CFR §§86.319 and 86.320; 86.326 and 86.327; and 86.330 to 86.333. Also see 40 CFR §86.119.

IV. Data Submission

21. Data submission:

(a) Test results shall be submitted in two manners, packets and punched (and interpreted) 80 column cards. Formats for these submissions shall be specified by the project officer within two months after contract award.

(b) Information to be submitted shall include (as applicable):

Engine Identification
Test Numbers, Dates

Idle RPM (as recieved/adjusted)

Timing (as received/adjusted)

Dwell (as received/adjusted)

Torque curve data

Idle Emissions HC, CO, NOx (as received/adjusted)

Barometric pressure

Ambient temperature

Analyzer calibration curves

CVS Test data, recorded for each segment:

- Inlet air temperature average for wet and dry bulbs
- CVS inlet temperature, PDP only
- CVS flow and raw data
- Background and Sample bag concentrations of HC, CO, CO_2 and NOx including zero and span readings and gas concentrations
- Diesel engine test shall include HFID analyzer data
- Integrated horsepower-hours
- Calculated emissions in grams, grams/mile, grams/hp-hr, grams/lb fuel, grams/kw-hr, grams/km and grams/kg fuel for each segment

(c) Strip charts and test notes shall be retained and submitted as requested by the project officer.

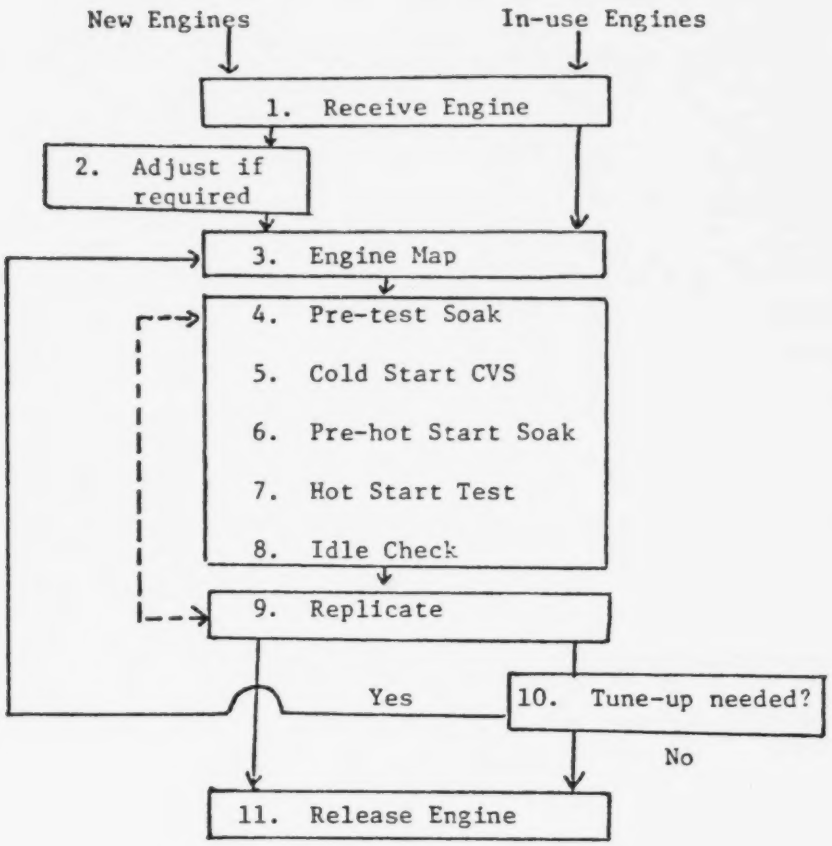
Table A-1

Tentative Engine List

Manufacturer	CID	# New Engines	# In-Use	# Prototypes
Gasoline Engines				
CHRYSLER	318	1 to 2	0 to 1	↑
	360	1 to 2	0 to 1	Undetermined
	440	1 to 2	1	possibly
GENERAL MOTORS	350	1 to 3	1	LDT
	400	1	0 to 1	engines
FORD	300	1	0 to 1	with
	351	1 to 3	1	catalysts
	400	1	0 to 1	will
IHC	196	0 to 1	0 to 1	be
	304	0 to 1	0 to 1	tested
	345	1	0 to 1	↓
	391	0 to 1	0 to 1	
	400	0 to 1	0 to 1	
	446	0 to 1	0 to 1	___
TOTAL GASOLINE TO BE TESTED		15	7	3
Diesel Engines				
CUMMINS	855	1 to 3	1 to 2	
	1150	1 to 3	1 to 2	
CATERPILLAR	636	1 to 3	1 to 2	
MACK	672	1 to 3	1 to 2	
GENERAL MOTORS	568	1 to 2	0 to 1	
	552	1 to 2	0 to 1	
	736	1 to 3	1 to 2	
TOTAL DIESEL TO BE TESTED		15	10	

Figure 1

Test Sequence



APPENDIX A-3. CVS NINE-MODE TEST PROCEDURE

Note: Record Data on Sheet DD-2 for WARM-UP through Test

PRE-TEST

1. Bleed Flotron
2. Dyno Control to MANUAL, set SPEED SET to 1500 RPM (≃27.0 on dial)
3. Calibrate ACTUAL TORQUE
4. Calibrate ACTUAL RPM
5. Zero Flotron with ATTENUATOR set on 10v

WARM-UP (Evacuate bags during warm-up)

6. Turn WATER, IGN, BATTERY CHARGER and CVS on
7. Start Engine and run No Load at 1500±200 RPM for 1 minute
8. Run at 1500 rpm and 14±1 inch-Hg until Oil Temp is 200°F

MAX. LOAD

9. Go to WOT at 2000 rpm
10. Push Filter Buttons, start Chart (1 cm/min) and record data during minutes 1 to 2.
11. Go to 2000 rpm and 14±1 inch-Hg and start NINE-MODE TEST

NINE-MODE TEST (Start Directly from MAX. LOAD)

12. In 5 minutes or less, calculate modes and set up for running test and read: Baro, "Hg_____D.B. Temp., °F_____,R.H._____
13. Go to Mode 1 and Stabilize in one minute
14. Start Bag and Charts and Run 5 minutes (300 seconds)
15. Stop Bag and Charts and Record CVS Data
16. Repeat Steps 14 thru 16 for Modes 2 thru 9

Read: Baro, "Hg_____, D.B. Temp., °F_____, R.H._____

17. Go to 14±1 "Hg if testing is to continue or shut down
18. Assemble all data into a labeled envelope and deliver for processing.

APPENDIX A-4. PROGRAM TCP FOR DETERMINATION OF TEST ACCEPTABILITY

```
FTN,L
      PROGRAM TCP
C*****THIS PROGRAM CALCULATES THE PARAMETERS AND ACCEPTABILITY FOR A RUN
C     LATEST PROGRAM REVISION - AUGUST 27, 1979
      DIMENSION TC(600),SC(600),TP(600),SR(600),TR(600),IDTEST(71)
     1          ,ITT(7)
      DATA STX,STY,STX2,STY2,STXY,SSX,SSY,SSX2,SSY2,SSXY,SHX,SHY,SHX2,
     1 SHY2,SHXY/15*0./
      M=0
      N=0
      READ(10,13)ITT,ITID
13    FORMAT(7A1,I1)
      WRITE(6,60)ITT,ITID
60    FORMAT(1H0,30X,7A1,I1)
      READ(10,15)IDTEST
15    FORMAT(71A1)
      WRITE(6,16)IDTEST
16    FORMAT(1H0,71A1)
      READ(10,7)TCL,SCL,SRL,TRL,TPL,TCH,SCH,SRH,TRH,VOIDA
7     FORMAT(10F8.3)
      READ(10,28)VOIDB,VOIDC,VOIDD,VOIDE,TPH
28    FORMAT(5F8.3)
      READ(10,27)TCAL,TMAX,SCAL,SMAX,SIDL,HMAX,PTS
27    FORMAT(7F8.0)
      WRITE(6,11)TCL,TCH,SCL,SCH,SRL,SRH,TRL,TRH,TPL,TPH
11    FORMAT(1H0,10F8.3)
      WRITE(6,41)TCAL,TMAX,SCAL,SMAX,SIDL,HMAX,PTS
41    FORMAT(1H ,7F8.0)
      TCF=TMAX/(TCH-TCL)
      TRF=TCAL/(TRH-TRL)
      SCF=(SMAX-SIDL)/(SCH-SCL)
      SRF=SCAL/(SRH-SRL)
      TPCUT=(TPH-TPL)*.99+TPL
      NPT=PTS
      DO 6 J=1,2
      READ(9,1)(TC(I),SC(I),SR(I),TR(I),TP(I),I=1,NPT)
1     FORMAT(25X,5F6.0,25X,5F6.0)
      DO 8 I=1,NPT
      TC(I)=(TC(I)-TCL)*TCF
      SC(I)=(SC(I)-SCL)*SCF+SIDL
      SR(I)=SR(I)*SRF
8     TR(I)=TR(I)*TRF
      DO 6 I=1,NPT
      M=M+1
      SSX=SSX+SC(I)
      SSY=SSY+SR(I)
      SSX2=SSX2+SC(I)**2
      SSY2=SSY2+SR(I)**2
      SSXY=SSXY+SC(I)*SR(I)
      IF(ABS(TP(I)).GE.ABS(TPCUT).AND.TR(I).LT.TC(I))GO TO 6
      IF(TC(I).LT.(-.11*TMAX))GO TO 6
      N=N+1
      STX=STX+TC(I)
      STY=STY+TR(I)
      STX2=STX2+TC(I)**2
      STY2=STY2+TR(I)**2
```

```
      STXY=STXY+TC(I)*TR(I)
      SHX=SHX+TC(I)*SC(I)
      SHY=SHY+TR(I)*SR(I)
      SHX2=SHX2+(TC(I)*SC(I))**2
      SHY2=SHY2+(TR(I)*SR(I))**2
      SHXY=SHXY+TC(I)*SC(I)*TR(I)*SR(I)
6     CONTINUE
      TMN=STXY-STX*STY/N
      TMD=STX2-STX**2/N
      TM=TMN/TMD
      TR=STY/N-TM*STX/N
      TR2=TMN**2/(TMD*(STY2-STY**2/N))
      TSE=SQRT((STY2-TR*STY-TM*STXY)/N)*100./TMAX
      SMN=SSXY-SSX*SSY/M
      SMD=SSX2-SSX**2/M
      SM=SMN/SMD
      SR=SSY/M-SM*SSX/M
      SR2=SMN**2/(SMD*(SSY2-SSY**2/M))
      SSE=SQRT((SSY2-SR*SSY-SM*SSXY)/M)
      HMN=SHXY-SHX*SHY/N
      HMD=SHX2-SHX**2/N
      HM=HMN/HMD
      HR=(SHY/N-HM*SHX/N)/5252.
      HR2=HMN**2/(HMD*(SHY2-SHY**2/N))
      HSE=SQRT((SHY2-HR*SHY-HM*SHXY)/N)/(5252.*HMAX*.01)
      WRITE(6,18)
18    FORMAT(1H0,5X,"CALCULATED VALUES",14X,"ACCEPTANCE CRITERIA-HOT")
      WRITE(6,2)
2     FORMAT(1H ,4X,"SPEED TORQUE  POWER",
     1       15X,"SPEED    TORQUE     POWER")
      WRITE(6,3)SSE,TSE,HSE
3     FORMAT(1H ,"SE",X,F6.0,X,F5.0,"%",X,F5.0,"%",
     1       17X,"100.",5X,"13.%",7X,"8.%")
      WRITE(6,4)SM,TM,HM
4     FORMAT(1H ,"M ",X,F6.3,X,F6.3,X,F6.3,
     1       13X,".97-1.03",2X,".83-1.03",2X,".89-1.03")
      WRITE(6,5)SR2,TR2,HR2
5     FORMAT(1H ,"R2",X,F6.4,X,F6.4,X,F6.4,
     1       13X,".97-1.00",2X,".88-1.00",2X,".91-1.00")
      WRITE(6,9)SR,TR,HR
9     FORMAT(1H ,"R ",X,F6.0,X,F6.1,X,F6.1,
     1       15X,"-50+50",4X,"-15+15",6X,"-5+5")
      WRITE(6,10)M,N
10    FORMAT(1H ,"M=",I4,"N=",I4)
C*****THE FOLLOWING DETERMINES ACCEPTABILITY OF THE RUN BASED ON
C     THE DRAFT OF SUBPART N RECEIVED DECEMBER 1979
C     TEST EQUAL 1 FOR COLD START AND 2 FOR HOT START
      IF(SSE.GT.100.) GO TO 20
      IF(TSE.GT.13.) GO TO 20
      IF(HSE.GT.8.) GO TO 20
      IF(SR2.LT.0.970) GO TO 20
      IF(HR2.LT.0.910) GO TO 20
      IF(ABS(SR).GT.50.) GO TO 20
      IF(ABS(TR).GT.15.) GO TO 20
      IF(ABS(HR).GT.5.) GO TO 20
      IF(SM.LT.0.970) GO TO 20
```

```
      IF(SM.GT.1.030) GO TO 20
      IF(TM.LT.0.830) GO TO 30
      IF(TM.GT.1.030) GO TO 30
      IF(HM.LT.0.890) GO TO 30
      IF(HM.GT.1.030) GO TO 30
      IF(TR2.LT..880) GO TO 30
      WRITE(6,31)
31    FORMAT(1H ,"THIS RUN IS ACCEPTABLE BASED ON DRAFT SUBPART N JAN ",
     1            "1980")
      IF(ITID.EQ.0) GO TO 45
      IF(ITID.GT.2) GO TO 45
      GO TO 50
20    IF(ITID.EQ.1) GO TO 40
30    IF(ITID.EQ.1) GO TO 35
      IF(ITID.EQ.0) GO TO 45
      IF(ITID.GT.2) GO TO 45
      WRITE(6,32)
32    FORMAT(1H ,"THIS HOT START RUN IS UNACCEPTABLE BASED ON ",
     1"DRAFT SUBPART N JAN. 1980")
      GO TO 50
35    CONTINUE
      IF(TM.LT.0.770) GO TO 40
      IF(TM.GT.1.030) GO TO 40
      IF(HM.LT.0.870) GO TO 40
      IF(HM.GT.1.030) GO TO 40
      IF(TR2.LT.0.850) GO TO 40
      WRITE (6,33)
33    FORMAT(1H ,"THIS COLD START RUN IS ACCEPTABLE BASED ON",
     1" DRAFT SUBPART N JAN 1980")
      GO TO 50
40    WRITE(6,34)
34    FORMAT(1H ,"THIS COLD START RUN IS UNACCEPTABLE BASED ON",
     1" DRAFT SUBPART N JAN. 1980")
      GO TO 50
45    WRITE(6,19)
19    FORMAT(1H ,"****DATA CARD OMITTED-TEST WAS NOT IDENTIFIED",
     1     "AS TO COLD-OR HOT-START****")
50    CONTINUE
      WRITE(6,12)
12    FORMAT(1H1)
      STOP
      END
```

APPENDIX A-4 (Cont'd). PROGRAM TCP FOR DETERMINATION OF TEST ACCEPTABILITY

TCP SAMPLE PRINTOUT

C-START1

TEST 22-4 1973GMC 366 GASOLINE 03-17-80

-.456	6.561	.806	6.813	.001	5.003	.000	4.010	.636	4.584
1249.	286.	7500.	4000.	550.	178.	572.			

	CALCULATED VALUES		
	SPEED	TORQUE	POWER
SE	93.	9.%	6.%
M	.979	.929	.976
R2	.9918	.9263	.9738
R	31.	9.0	1.2

N=1144N=1134

THIS RUN IS ACCEPTABLE BASED ON DRAFT SUBPART N JAN 1980

ACCEPTANCE CRITERIA-HOT		
SPEED	TORQUE	POWER
100.	13.%	8.%
.97-1.03	.83-1.03	.89-1.03
.97-1.00	.88-1.00	.91-1.00
-50+50	-15+15	-5+5

C-START1

TEST 22-2 1973GMC 366 GASOLINE 03-11-80

-.456	6.565	.811	6.818	.002	5.005	.021	4.026	.646	4.522
1249.	296.	7500.	4000.	550.	178.	572.			

	CALCULATED VALUES		
	SPEED	TORQUE	POWER
SE	107.	8.%	6.%
M	.992	.935	.993
R2	.9893	.9452	.9797
R	49.	8.3	1.4

N=1144N=1134

THIS COLD START RUN IS UNACCEPTABLE BASED ON DRAFT SUBPART N JAN. 1980

ACCEPTANCE CRITERIA-HOT		
SPEED	TORQUE	POWER
100.	13.%	8.%
.97-1.03	.83-1.03	.89-1.03
.97-1.00	.88-1.00	.91-1.00
-50+50	-15+15	-5+5

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APPENDIX B

HC AND CO BASELINE TEST RESULTS

Table Number	Engine Number	Description
		Summary of the Results
B-1	2	1969 IHC 304
B-2	3	1969 IHC 345
B-3	4	1969 IHC 304
B-4	5	1969 Chevrolet 366
B-5	9[a]	1969 Chevrolet 366
B-6	13	1969 Ford 360
B-7 thru B-12	All	Transient Test Computer Printouts
B-13 thru B-17	2 thru 9	Nine-Mode Computer Printouts

TABLE B-1. ENGINE 2 SUMMARY OF RESULTS
1969 IHC 304

TRANSIENT CYCLE

		TEST 2-1			TEST 2-2			Average
		Cold	Hot	Composite	Cold	Hot	Composite	
HC,	g/kW-hr	16.79	12.21	12.86	14.74	10.53	11.13	12.00
CO,	g/kW-hr	176.52	170.82	171.63	163.75	154.77	156.05	163.84
CO_2,	g/kW-hr	1019	983	988	998	961	966	977
NOX,	g/kW-hr	7.94	8.54	8.45	7.86	8.38	8.31	8.38
SFC,	kg/kW-hr	0.425	0.407	0.410	0.410	0.390	0.393	0.402
WORK,	kW-hr	6.77	7.00	6.97	6.97	7.02	7.01	6.99
POWER,	kW	20.89	21.60	21.50	21.50	21.60	21.64	21.57

NINE MODE

		Test 2-1	Test 2-3	Average
HC,	g/kW-hr	25.774	25.472	25.623
CO,	g/kW-hr	151.450	149.885	150.668
CO_2,	g/kW-hr		--	--
NOX,	g/kW-hr	9.526	9.852	9.689
SFC,	kg/kW-hr	0.430	0.431	0.431

ENGINE DESCRIPTION

Engine: 1969 IHC 304 CID V-8 S/N 304-648048
Rated Power: 193 Hp at 4400 rpm
Rated Torque: 273 ft lbs at 2800 rpm
Measured Idle Speed: 700 rpm

Comments: Rated Power and Torque are not applicable.

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	12.00	8.95	HC	29.85	8.06
CO,	g/kW-hr (g/hp-hr)	163.84	122.18	CO	407.56	110.01
NOX,	g/kW-hr (g/hp-hr)	8.38	6.25	NOX	20.85	5.63
SFC,	kg/kW-hr (lb/hp-hr)	0.402	0.661	FUEL CONS.	--	270.
WORK,	kW-hr (hp-hr)	6.99	9.37			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE B-1 (Cont'd). ENGINE 2 SUMMARY OF RESULTS
1969 IHC 304

TRANSIENT CYCLE MODAL RESULTS[b]

	Cold Cycle				Hot Cycle			
Test 2-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	45.27	23.90	22.70	21.72	18.28	22.38	23.80	20.95
CO, gram	284.97	243.14	421.09	245.38	217.03	258.51	469.09	250.64
CO_2, gram	749.7	1486.4	3994.9	664.3	690.6	1451.0	4046.5	690.1
NOX, gram	2.54	10.87	36.48	3.85	3.68	12.08	40.27	3.72
FUEL, kg	0.423	0.613	1.491	0.353	0.343	0.608	1.532	0.363
KW-HR	0.53	1.29	4.33	0.62	0.61	1.39	4.36	0.63
TEST 2-2								
HC, gram	47.14	25.88	20.24	9.50	12.90	15.26	22.80	22.88
CO, gram	290.11	261.19	429.23	160.78	160.17	202.49	469.96	253.18
CO_2 gram	726.9	1528.1	3993.0	706.	689.7	1430.1	3934.9	685.2
NOX, gram	2.42	10.77	37.97	3.65	4.04	12.42	38.58	3.73
FUEL, kg	0.420	0.637	1.492	0.312	0.310	0.566	1.496	0.364
KW-HR	0.56	1.38	4.36	0.68	0.63	1.39	4.38	0.61

POWER MAPPING (TQ in ft-lb) @ Temp. - 68 Baro. - 29.21

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	195	2100	222	3100	211	4100	
-		1200	199	2200	222	3200	208	4200	
-		1300	203	2300	222	3300	205	4300	
400		1400	207	2400	222	3400	202	4400	
500	157	1500	210	2500	222	3500	198	4500	
600	165	1600	213	2600	221	3600	194	4600	
700	172	1700	216	2700	219	3700	190	4700	
800	178	1800	218	2800	218	3800	185	4800	
900	184	1900	219	2900	216	3900	0	4900	
1000	189	2000	221	3000	214	4000		5000	

[b] Barometric Pressure: Test 2-1 = 745 mm Hg Test 2-2 = 743 mm Hg

TABLE B-2. ENGINE 3 SUMMARY OF RESULTS
1969 IHC 345

TRANSIENT CYCLE

		TEST 3-1			TEST 3-2			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	14.46	9.53	10.23	14.87	7.60	8.64	9.44
CO,	g/kW-hr	108.85	123.74	121.61	100.38	133.33	128.62	125.12
CO_2,	g/kW-hr	1044	990	998	1096	988	1003	1001
NOX,	g/kW-hr	10.73	9.87	9.99	11.22	10.29	10.42	10.21
SFC,	kg/kW-hr	0.397	0.383	0.385	0.410	0.385	0.389	0.387
WORK,	kW-hr	6.73	6.64	6.65	6.45	6.84	6.78	7.72
POWER,	kW	20.76	20.48	20.52	19.90	21.10	20.93	20.73

NINE MODE

		Test 3-1	Test 3-2	Average
HC,	g/kW-hr	9.862	9.059	9.461
CO,	g/kW-hr	93.021	80.898	86.960
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	12.515	12.283	12.399
SFC,	kg/kW-hr	0.413	0.413	0.413

ENGINE DESCRIPTION

Engine: 1969 IHC 345 CID V-8 S/N 687073
Rated Power: 197 hp at 4000 rpm
RAted Torque: 304 ft lbs at 2200 rpm
Measured Idle Speed: 470 rpm

Comments: Rated Power and Torque are not applicable.

TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	9.44	(7.04)	HC 24.39	6.09
CO,	g/kW-hr (g/hp-hr)	125.12	(93.30)	CO 323.31	80.77
NOX,	g/kW-hr (g/hp-hr)	10.21	(7.61)	NOX 26.38	6.59
SFC,	kg/kW-hr (lb/hp-hr)	0.387	(0.636)	FUEL CONS. --	250.
WORK,	kW-hr (hp-hr)	6.72	(0.01)		

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE B-2 (Cont'd.) ENGINE 3 SUMMARY OF RESULTS
1969 IHC 345

TRANSIENT CYCLE MODAL RESULTS[b]

	Cold Cycle				Hot Cycle			
Test 3-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	43.80	22.45	19.42	11.70	14.31	15.44	19.51	14.07
CO, gram	161.35	165.06	304.37	102.28	114.38	193.70	371.31	142.80
CO_2, gram	781.6	1525.5	4095.9	624.8	568.8	1388.9	4040.6	582.2
NOX, gram	2.78	12.55	52.90	4.05	2.92	10.51	48.68	3.46
FUEL, kg	0.370	0.585	1.461	0.259	0.250	0.549	1.477	0.268
KW-HR	0.44	1.28	4.45	0.56	0.41	1.29	4.40	0.55
TEST 3-2								
HC, gram	43.89	22.56	17.94	11.54	15.30	11.80	18.74	6.18
CO, gram	125.63	151.00	276.99	93.89	123.54	223.47	437.71	127.66
CO_2 gram	640.1	1552.6	4247.7	631.9	671.0	1367.8	4103.9	617.7
NOX, gram	1.92	12.60	54.26	3.56	4.33	11.32	50.67	4.11
FUEL, kg	0.308	0.587	1.494	0.257	0.288	0.554	1.529	0.264
KW-HR	0.21	1.27	4.43	0.54	0.54	1.28	4.47	0.55

POWER MAPPING (TQ in ft-lb) @ Temp. - 78 Baro. - 29.22

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	222	2100	250	3100	226	4100	
-		1200	228	2200	250	3200	221	4200	
-		1300	232	2300	249	3300	216	4300	
400	169	1400	236	2400	248	3400	210	4400	
500	178	1500	240	2500	246	3500	0	4500	
600	187	1600	243	2600	244	3600		4600	
700	195	1700	246	2700	242	3700		4700	
800	203	1800	248	2800	239	3800		4800	
900	210	1900	249	2900	235	3900		4900	
1000	216	2000	250	3000	231	4000		5000	

[b]Barometric Pressure: Test 3-1 = 745 mm Hg Test 3-2 = 748 mm Hg.

TABLE B-3. ENGINE 4 SUMMARY OF RESULTS
1969 IHC 304

TRANSIENT CYCLE

		TEST 4-1			TEST 4-3			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	14.65	10.92	11.45	17.30	11.77	12.56	12.01
CO,	g/kW-hr	154.98	158.61	158.09	164.08	158.53	159.32	158.71
CO_2,	g/kW-hr	923.	876.	883.	923.	882.	888.	886.
NOX,	g/kW-hr	7.55	7.48	7.49	8.19	8.12	8.13	7.81
SFC,	kg/kW-hr	0.382	0.366	0.368	0.390	0.368	0.371	0.370
WORK,	kW-hr	6.42	6.64	6.61	6.36	6.67	6.63	6.62
POWER,	kW	19.81	20.48	20.38	19.62	20.58	20.44	20.41

NINE MODE

	Test 4-3	Test 4-5	Average
HC, g/kW-hr	26.773	27.481	27.127
CO, g/kW-hr	167.466	166.821	167.144
CO_2, g/kW-hr	--	--	--
NOX, g/kW-hr	8.798	8.688	8.743
SFC. kg/kW-hr	0.423	0.422	0.423

ENGINE DESCRIPTION

Engine: 1969 IHC 304 CID V-8 S/N V304-735364
Rated Power: 193 hp at 4400 rpm
Rated Torque: 273 ft lbs at 2800 rpm
Measured Idle Speed: 475 rpm

Comments: Rated Power and Torque are not applicable.

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	12.01	(8.96)	HC	32.46	7.64
CO,	g/kW-hr (g/hp-hr)	158.71	(118.35)	CO	428.95	100.93
NOX,	g/kW-hr (g/hp-hr)	7.81	(5.82)	NOX	21.11	4.97
SFC,	kg/kW-hr(lb/hp-hr)	0.370	(0.609)	FUEL CONS.	--	235.
WORK,	kW-hr (hp-hr)	6.62	(8.88)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE B-3 (Cont'd). ENGINE 4 SUMMARY OF RESULTS
1969 IHC 304

TRANSIENT CYCLE MODAL RESULTS [b]

	Cold Cycle				Hot Cycle			
TEST 4-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	39.17	20.01	21.70	13.17	14.92	17.87	23.11	16.54
CO, gram	174.80	207.49	443.27	169.25	145.68	224.21	502.99	179.58
CO_2, gram	527.4	1279.1	3581.1	538.3	538.3	1203.8	3527.9	540.0
NOX, gram	1.32	8.93	35.52	2.71	2.72	8.40	35.62	2.87
FUEL, kg	0.292	0.526	1.370	0.267	0.257	0.508	1.384	0.276
KW-HR	0.28	1.26	4.36	0.52	0.51	1.26	4.35	0.51
TEST 4-3								
HC, gram	43.08	24.33	23.41	19.13	17.60	18.92	23.63	18.40
CO, gram	170.15	227.98	467.62	177.07	153.14	224.03	499.52	180.97
CO_2, gram	475.4	1284.4	3579.9	529.1	519.4	1185.0	3641.0	539.9
NOX, gram	1.38	9.79	37.86	3.05	2.93	8.94	39.26	3.01
FUEL, kg	0.277	0.542	1.384	0.274	0.257	0.503	1.419	0.278
KW-HR	0.22	1.25	4.38	0.51	0.51	1.26	4.39	0.51

POWER MAPPING (TQ in ft-lb) @ Temp. - 78° Baro. - 29.16

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	191	2100	222	3100	217	4100	
-		1200	196	2200	223	3200	215	4200	
-		1300	201	2300	224	3300	212	4300	
400	142	1400	205	2400	224	3400	209	4400	
500	151	1500	208	2500	224	3500	205	4500	
600	159	1600	212	2600	224	3600	201	4600	
700	167	1700	214	2700	223	3700	197	4700	
800	174	1800	217	2800	222	3800	192	4800	
900	180	1900	219	2900	221	3900	0	4900	
1000	186	2000	221	3000	219	4000		5000	

[b] Barometric Pressure: Test 4-1 = 745 mm Hg Test 4-3 = 748 mm Hg.

TABLE B-4. ENGINE 5 SUMMARY OF RESULTS
1969 Chevrolet 366

TRANSIENT CYCLE

		TEST 5-3			TEST 5-4			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	20.04	16.26	16.80	17.76	11.81	12.66	14.73
CO,	g/kW-hr	292.29	251.48	257.31	290.46	249.75	255.57	256.44
CO_2,	g/kW-hr	982.	942.	948.	1060.	1015.	1021.	985.
NOX,	g/kW-hr	3.58	3.91	3.86	4.68	4.97	4.93	4.40
SFC,	kg/kW-hr	0.474	0.438	0.443	0.496	0.456	0.462	0.453
WORK,	kW-hr	7.40	7.71	7.67	7.39	7.79	7.73	7.70
POWER,	kW	22.83	23.79	23.65	22.80	24.03	23.85	23.75
kW-hr Dev.[b]		-4.7	-0.8	--	0.4	-4.8	--	--

NINE MODE

		Test 5-3	Test 5-4	Average
HC,	g/kW-hr	16.623	17.499	17.061
CO,	g/kW-hr	230.329	228.677	229.503
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	4.747	4.721	4.734
SFC,	kg/kW-hr	0.457	0.456	0.457

ENGINE DESCRIPTION

Engine: 1969 Chevrolet 366 CID V-8 S/N 3955274T
Rated Power: 235 hp at 4000 rpm
Rated Torque: 345 ft lbs at 2600 rpm
Measured Idle Speed: 500 rpm

Comments: Rated Power and Torque are not applicable.

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	14.73	(10.98)	32.52	10.90
CO,	g/kW-hr	(g/hp-hr)	256.44	(191.23)	566.09	189.68
NOX,	g/kW-hr	(g/hp-hr)	4.40	(3.28)	9.71	3.26
SFC,	kg/kW-hr	(lb/hp-hr)	0.453	(0.745)	--	355.
WORK,	kW-hr	(hp-hr)	7.70	(10.33)		

FUEL CONS.

[a] Using a composite value of 10.41 km for the Transient Cycle.
[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.

TABLE B-4 (Cont'd). ENGINE 5 SUMMARY OF RESULTS
1969 Chevrolet 366

TRANSIENT CYCLE MODAL RESULTS [C]

	Cold Cycle				Hot Cycle			
TEST 5-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	41.40	40.63	40.25	25.97	44.74	25.69	35.27	19.56
CO, gram	222.47	476.02	1223.87	239.71	223.97	417.93	1098.81	197.22
CO_2, gram	749.6	1694.6	4085.1	731.7	740.7	1635.0	4096.4	789.7
NOX, gram	1.92	7.96	14.21	2.39	2.61	6.51	18.36	2.67
FUEL, kg	0.388	0.811	1.934	0.375	0.389	0.748	1.871	0.366
KW-HR	0.26	1.43	5.14	0.56	0.56	1.46	5.12	0.56
TEST 5-4								
HC, gram	41.79	36.20	36.11	17.13	18.82	22.07	35.71	15.36
CO, gram	238.45	504.10	1184.22	219.12	194.06	375.62	1154.62	220.79
CO_2, gram	776.1	1807.4	4426.6	818.0	862.4	1733.1	4451.5	862.1
NOX, gram	2.07	7.00	22.64	2.82	3.27	8.28	24.18	2.99
FUEL, kg	0.405	0.856	2.018	0.384	0.387	0.755	2.011	0.397
KW-HR	0.24	1.46	5.12	0.57	0.56	1.48	5.15	0.60

POWER MAPPING (TQ in ft-lb) @ Temp. - 78 Baro. - 29.49

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	237	2100	275	3100	280	4100	0
-		1200	244	2200	276	3200	276	4200	
-		1300	246	2300	277	3300	274	4300	
400		1400	249	2400	278	3400	269	4400	
500	83	1500	254	2500	278	3500	264	4500	
600	185	1600	260	2600	279	3600	256	4600	
700	211	1700	266	2700	280	3700	251	4700	
800	220	1800	268	2800	280	3800	243	4800	
900	225	1900	271	2900	280	3900	231	4900	
1000	231	2000	274	3000	280	4000	223	5000	

[C]Barometric Pressure: Test 5-3 = 741 mm Hg Test 5-4 = 736 mm Hg.

TABLE B-5. ENGINE 9 SUMMARY OF RESULTS
1969 Chevrolet 366

TRANSIENT CYCLE

		TEST 9-1			TEST 9-3			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	12.96	11.02	11.30	16.24	10.47	11.29	11.42
CO,	g/kW-hr	187.74	170.56	173.01	195.95	187.22	188.47	180.74
CO_2,	g/kW-hr	947.	927.	930.	970.	972.	972.	959.
NOX,	g/kW-hr	5.57	5.68	5.66	5.83	6.14	6.10	6.24
SFC,	kg/kW-hr	0.404	0.388	0.390	0.419	0.410	0.411	0.403
WORK,	kW-hr	7.65	7.66	7.66	7.59	7.53	7.54	7.56
POWER,	kW	23.60	23.63	23.63	23.42	23.23	23.26	23.31

NINE MODE

		Test 9-2	Test 9-3	Average
HC,	g/kW-hr	17.665	17.077	17.371
CO,	g/kW-hr	263.118	287.357	275.24
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	3.564	3.334	3.449
SFC,	kg/kW-hr	0.495	0.504	0.500

TRANSIENT CYCLE AVERAGE VALUES

						g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	11.42	(8.52)	HC	28.34	8.25
CO,	g/kW-hr	(g/hp-hr)	180.74	(134.78)	CO	448.49	131.95
NOX,	g/kW-hr	(g/hp-hr)	6.24	(4.65)	NOX	15.48	4.29
SFC,	kg/kW-hr	(lb/hp-hr)	0.403	(0.663)			
WORK,	kW-hr	(hp-hr)	7.56	(10.14)	FUEL CONS.	--	293.

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE B-5 (Cont'd). ENGINE 9 SUMMARY OF RESULTS
1969 Chevrolet 366

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 9-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	50.	10.%	7.%	51.	8.%	5.%
Slope	1.006	.926	.958	1.002	.927	.960
Corr. Coef.	.9973	.9158	.9597	.9972	.9474	.9762
Intercept	5.	5.9	1.7	16.	2.8	.8
Points Used	1144	1107	1107	1144	1140	1140
kW-hr Dev.[b]	----------	-3.8	----------	----------	-3.7	----------
TEST 9-3						
Standard Error	55.	12.%	7.%	53.	8.%	6.%
Slope	1.006	.857	.923	1.005	.896	.934
Corr. Coef.	.9968	.8521	.9468	.9971	.9335	.9669
Intercept	7.	6.4	1.4	14.	3.2	.9
Points Used	1144	1132	1132	1144	1144	1144
kW-hr Dev.[b]	----------	-4.5	----------	----------	-5.3	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
Test 9-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	37.59	23.02	26.60	11.90	26.64	18.92	25.87	12.95
CO, gram	219.37	320.03	722.4	173.99	179.62	303.17	652.45	170.74
CO_2, gram	779.7	1621.9	4069.9	757.4	748.1	1578.6	4050.1	719.5
NOX, gram	2.65	9.02	27.98	2.9	3.37	8.06	29.03	3.00
FUEL, kg	0.392	0.696	1.667	0.337	0.351	0.667	1.626	0.324
KW-HR	0.59	1.46	5.02	0.58	0.59	1.46	5.02	0.58
TEST 9-3								
HC, gram	44.26	25.38	41.00	12.71	15.74	18.24	29.54	15.40
CO, gram	201.47	320.38	785.16	180.91	160.35	297.27	778.22	174.71
CO_2 gram	856.1	1685.1	4115.7	711.9	831.5	1645.4	4109.8	736.2
NOX, gram	3.19	10.77	27.91	2.43	3.90	9.61	30.05	2.67
FUEL, kg	0.414	0.715	1.727	0.327	0.357	0.684	1.711	0.334
KW-HR	0.64	1.47	4.91	0.57	0.61	1.44	4.91	0.58

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 9-1 = 748 mm Hg Test 9-3 = 738 mm Hg.

TABLE B-5 (Cont'd). ENGINE 9 SUMMARY OF RESULTS
1969 Chevrolet 366

ENGINE DESCRIPTION

Engine: 1969 Chevrolet 366 CID No. 3955274T
Carburetor: Holley 4-Barrel list 4098-1
Distributor: Delco-Remy 1111337
Rated Power:
Maximum Torque:
Comments:

ENGINE DATA

	Measured
Max. Engine Torque, Ft-Lb @ RPM	280 @ 2300
Max. Engine Power, HP @ RPM	172 @ 3700
Cylinder Compression, psi min.-max. (avg.)	75-105(91)
Idle RPM	500

POWER MAPPING (TQ in ft-lb) @ Temp. - 77° Baro. - 29.34

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	237	2100	274	3100	271	4100	
-		1200	241	2200	277	3200	270	4200	
-		1300	242	2300	280	3300	266	4300	
400		1400	240	2400	279	3400	261	4400	
500		1500	244	2500	279	3500	254	4500	
600	154	1600	255	2600	279	3600	250	4600	
700	212	1700	260	2700	275	3700	244	4700	
800	221	1800	265	2800	275	3800	237	4800	
900	225	1900	269	2900	273	3900	230	4900	
1000	233	2000	275	3000	272	4000	0	5000	

TABLE B-5 (Cont'd). ENGINE 9 SUMMARY OF RESULTS
1969 Chevrolet 366

TRANSIENT CYCLE

		TEST 9-4			TEST			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	16.27	10.91	11.68				
CO,	g/kW-hr	207.52	176.29	180.75				
CO_2,	g/kW-hr	978.	975.	975.				
NOX,	g/kW-hr	6.74	7.01	6.97				
SFC,	kg/kW-hr	0.427	0.406	0.409				
WORK,	kW-hr	7.53	7.46	7.47				
POWER,	kW	23.23	23.01	23.04				

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 9-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	53.	11.%	7.%	55.	8.%	5.%
Slope	1.006	.870	.923	1.002	.893	.927
Corr. Coef.	.9970	.8847	.9524	.9968	.9450	.9741
Intercept	9.	5.8	1.5	20.	3.3	.9
Points Used	1144	1127	1127	1144	1143	1143
kW-hr Dev.[d]	----------	-5.4	----------	----------	-6.1	----------

TRANSIENT CYCLE MODAL RESULTS[e]

	Cold Cycle				Hot Cycle			
Test 9-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	39.61	24.68	45.19	12.93	17.25	19.11	28.90	16.18
CO, gram	217.81	286.56	795.13	162.10	142.32	298.27	750.12	124.65
CO_2, gram	892.2	1611.3	4104.5	748.8	734.9	1586.1	4177.3	774.8
NOX, gram	3.81	10.10	33.44	3.36	3.73	10.22	34.70	3.64
FUEL, kg	0.429	0.724	1.733	0.329	0.319	0.667	1.717	0.322
KW-HR	0.61	1.45	4.89	0.57	0.58	1.44	4.89	0.56

[d] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[e] Barometric Pressure: Test 9-4 = 740 mm Hg.

TABLE B-6. ENGINE 13 SUMMARY OF RESULTS
1969 Ford 360

TRANSIENT CYCLE

		TEST 13-2			TEST 13-3			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	11.00	7.28	7.81	12.72	7.95	8.63	8.22
CO,	g/kW-hr	160.41	123.05	128.39	164.78	127.22	132.59	131.99
CO_2,	g/kW-hr	1042.	985.	993.	1000.	974.	978.	980.
NOX,	g/kW-hr	6.56	7.25	7.15	6.40	7.03	6.94	6.97
SFC,	kg/kW-hr	0.419	0.379	0.385	0.409	0.378	0.382	0.382
WORK,	kW-hr	8.28	8.45	8.43	8.43	8.45	8.45	8.45
POWER,	kW	25.54	26.07	25.99	26.01	26.07	26.06	26.05

NINE MODE

		Test 13-1	Test 13-2	Test 13-5	Average
HC,	g/kW-hr	14.39	15.19	14.76	14.78
CO,	g/kW-hr	80.21	76.42	72.72	76.45
CO_2,	g/kW-hr	1171.9	1279.9	1146.6	1199.
NOX,	g/kW-hr	6.88	7.42	6.93	7.08
SFC,	kg/kW-hr	0.443	0.422	0.456	0.447
POWER,	kW	19.2	19.2	18.7	19.0

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	8.22	(6.13)	HC	21.52	6.67
CO,	g/kW-hr (g/hp-hr)	131.99	(98.43)	CO	345.52	107.14
NOX,	g/kW-hr (g/hp-hr)	6.97	(5.20)	NOX	18.25	5.66
SFC,	kg/kW-hr (lb/hp-hr)	0.382	(0.628)	FUEL CONS.	--	311.
WORK,	kW-hr (hp-hr)	8.45	(11.33)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE B-6 (Cont'd). ENGINE 13 SUMMARY OF RESULTS
1969 Ford 360

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 13-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	66.	9.%	7.%	70.	5.%	6.%
Slope	.990	.940	.973	.993	.947	.975
Corr. Coef.	.9958	.9310	.9640	.9953	.9734	.9864
Intercept	-3.	7.5	1.4	1.	8.6	1.8
Points Used	1144	1090	1090	1144	1129	1129
kW-hr Dev.[b]	----------	0	----------	----------	2.0	----------
TEST 13-3						
Standard Error	63.	7.%	7.%	60.	6.%	6.%
Slope	.989	.953	.977	.991	.961	.987
Corr. Coef.	.9962	.9504	.9752	.9965	.9713	.9845
Intercept	4.	9.9	2.6	6.	7.4	1.4
Points Used [b]	1144	1085	1085	1144	1143	1143
kW-hr Dev.	----------	1.7	----------	----------	2.0	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
Test 13-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	31.96	21.30	26.82	11.04	12.00	14.50	24.82	10.20
CO, gram	199.72	255.65	706.76	166.71	118.04	159.23	615.42	147.01
CO_2, gram	954.6	1814.4	4953.2	906.5	850.4	1822.7	4820.4	827.0
NOX, gram	2.39	8.74	38.86	4.37	4.04	11.20	41.91	4.08
FUEL, kg	0.432	0.720	1.938	0.379	0.339	0.668	1.849	0.344
KW-HR	0.60	1.60	5.35	0.73	0.74	1.62	5.34	0.74
TEST 13-3								
HC, gram	42.63	23.80	28.26	12.51	13.26	15.81	26.88	11.25
CO, gram	212.99	276.91	731.20	165.75	119.37	160.11	644.37	151.04
CO_2 gram	904.7	1803.7	4856.4	859.9	836.4	1816.0	4744.5	831.3
NOX, gram	2.46	8.86	38.28	4.30	3.99	11.09	40.29	4.03
FUEL, kg	0.433	0.730	1.921	0.366	0.336	0.668	1.842	0.348
KW-HR	0.67	1.63	5.37	0.75	0.73	1.62	5.36	0.74

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 13-2 = 745 mm Hg Test 13-3 = 745 mm Hg.

TABLE B-6 (Cont'd). ENGINE 13 SUMMARY OF RESULTS
1969 Ford 360

ENGINE DESCRIPTION

Engine: 1969 Ford 360 CID Tag No. 9E13F
Carburetor:
Distributor:
Rated Power:
Maximum Torque:
Comments:

ENGINE DATA

	Measured
Max. Engine Torque, Ft-Lb @ RPM	265 @ 2200
Max. Engine Power, HP @ RPM	158 @ 4000
Cylinder Compression, psi min.-max. (avg.)	--
Idle RPM	600

POWER MAPPING (TQ in ft-lb) @ Temp. - 81 Baro. - 29.25

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	232	2100	264	3100	246	4100	
-		1200	238	2200	265	3200	242	4200	
-		1300	241	2300	264	3300	236	4300	
400	193	1400	244	2400	263	3400	232	4400	
500	213	1500	247	2500	262	3500	228	4500	
600	219	1600	252	2600	261	3600	224	4600	
700	229	1700	256	2700	259	3700	219	4700	
800	225	1800	258	2800	257	3800	216	4800	
900	226	1900	260	2900	256	3900	213	4900	
1000	230	2000	262	3000	252	4000	208	5000	

TABLE B-6 (Cont'd). ENGINE 13 SUMMARY OF RESULTS
1969 Ford 360

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 13-1									
1	Idle	0	0.232	32.94	237.36	731.9	0.22	0.337	0.00
2	25%	85	0.077	9.80	21.06	2176.1	7.24	0.741	1.38
3	55%	190	0.147	33.20	117.45	5795.6	45.71	2.094	5.85
4	25%	85	0.077	9.39	31.31	2099.3	6.55	0.734	1.38
5	10%	34	0.057	4.32	13.76	1179.5	1.68	0.401	0.40
6	25%	85	0.077	9.61	27.40	2178.1	7.14	0.751	1.38
7	90%	312	0.113	51.03	950.04	5896.4	56.53	2.486	7.38
8	25%	85	0.077	9.72	37.77	2143.5	6.75	0.727	1.38
9	CT	0	0.143	115.66	99.72	242.0	0.02	0.221	0.00
Test 13-2									
1	Idle	0	0.232	35.11	152.48	968.8	0.22	0.421	0.00
2	25%	88	0.077	9.67	22.60	2079.9	6.42	0.727	1.42
3	55%	190	0.147	33.38	98.59	5970.4	49.13	2.067	5.85
4	25%	85	0.077	9.37	29.79	3899.5	6.50	0.699	1.31
5	10%	34	0.057	4.38	13.86	1169.2	1.85	0.388	0.37
6	25%	90	0.077	9.81	25.28	2226.7	7.93	0.741	1.42
7	90%	315	0.113	55.62	978.87	5854.3	62.88	2.607	7.44
8	25%	85	0.077	10.24	35.63	2129.2	7.25	0.709	1.36
9	CT	0	0.143	123.84	108.40	250.0	0.09	0.227	0.00
Test 13-5									
1	Idle	0	0.232	18.40	200.14	678.2	0.00	0.421	0.00
2	25%	83	0.077	10.30	19.15	1918.0	5.42	0.726	1.33
3	55%	184	0.147	32.49	83.63	5663.5	45.55	2.100	5.68
4	25%	83	0.077	9.28	33.74	1954.4	5.63	0.727	1.33
5	10%	31	0.057	4.30	9.33	1123.8	1.58	0.414	0.37
6	25%	85	0.077	10.32	29.15	2103.8	7.01	0.751	1.38
7	90%	305	0.113	62.43	847.05	5740.1	57.56	2.399	7.23
8	25%	84	0.077	10.53	34.68	2088.2	6.69	0.734	1.36
9	CT	0	0.143	117.89	102.09	171.8	0.00	0.260	0.00

[d]Barometric Pressure: Test 13-1 = 737 mm Hg Test 13-2 = 736 mm Hg Test 13-5 = 735 mm Hg.

TABLE B-7A. TEST 2-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH304
ENGINE MODEL 69
ENGINE 5.0 L(304 CID) V-8
CVS NO. 4

TEST NO. 2-1 RUN
DATE 10/ 9/78
TIME 10:00
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 744.98 MM HG(29.33 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 65 PCT
ABSOLUTE HUMIDITY 11.0 GM/KG(77.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0111

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	711.2 (28.0)	744.2 (29.3)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	454.7 (17.9)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8086	8319	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	179.3 (6333)	202.1 (7138)	206.7 (7299)	179.1 (6324)
HC SAMPLE METER/RANGE/PPM	45.9/ 3/ 459	22.8/ 3/ 228	20.9/ 3/ 209	22.2/ 3/ 222
HC BCKGRD METER/RANGE/PPM	2.2/ 3/ 22	2.4/ 3/ 24	1.5/ 3/ 15	1.2/ 3/ 12
CO SAMPLE METER/RANGE/PPM	48.1/ 3/ 1916	36.7/ 3/ 1082	62.6/ 3/ 1893	41.5/ 3/ 1223
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 15	.6/ 3/ 18	.6/ 3/ 18	.5/ 3/ 15
CO2 SAMPLE METER/RANGE/PCT	17.2/ 3/ .28	27.0/ 3/ .44	62.1/ 3/ 1.10	15.5/ 3/ .25
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	2.9/ 3/ .04	2.9/ 3/ .04	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	7.7/ 2/ 8	28.3/ 2/ 28	91.9/ 2/ 92	11.9/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.5/ 2/ 1	.7/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	29.16	23.43	10.37	34.49
HC CONCENTRATION PPM	438	205	190	210
CO CONCENTRATION PPM	1365	1033	1750	1177
CO2 CONCENTRATION PCT	.23	.40	1.06	.20
NOX CONCENTRATION PPM	7.3	27.8	91.3	11.1
HC MASS GRAMS	45.27	23.90	22.70	21.72
CO MASS GRAMS	284.97	243.14	421.09	245.38
CO2 MASS GRAMS	749.7	1486.4	3994.9	664.3
NOX MASS GRAMS	2.54	10.87	36.48	3.85
FUEL KG (LB)	.423 (.93)	.613 (1.35)	1.491 (3.29)	.353 (.78)
KW HR (HP HR)	.53 (.71)	1.29 (1.73)	4.33 (5.81)	.62 (.83)
BSHC G/KW HR (G/HP HR)	85.62 (63.85)	18.56 (13.84)	5.24 (3.91)	35.00 (26.10)
BSCO G/KW HR (G/HP HR)	539.00 (401.93)	188.88 (140.85)	97.23 (72.51)	395.35 (294.82)
BSCO2 G/KW HR (G/HP HR)	1417.98 (1057.39)	1159.66 (861.03)	922.45 (687.87)	1070.40 (798.20)
BSNOX G/KW HR (G/HP HR)	4.80 (3.58)	8.45 (6.30)	8.42 (6.28)	6.21 (4.63)
BSFC KG/KW HR (LB/HP HR)	.800 (1.315)	.426 (.784)	.344 (.566)	.568 (.934)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.77 (9.08)	
BSHC G/KW HR (G/HP HR)	16.79 (12.52)	
BSCO G/KW HR (G/HP HR)	176.52 (131.63)	
BSCO2 G/KW HR (G/HP HR)	1013 (760)	
BSNOX G/KW HR (G/HP HR)	7.94 (5.92)	
BSFC KG/KW HR (LB/HP HR)	.425 (.699)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE B-7A (CONT'D). TEST 2-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IN304
ENGINE MODEL 69
ENGINE 5.0 L(304 CID) V-8
CVS NO. 9

TEST NO. 2-1 RUN
DATE 10/ 9/78
TIME 09:30
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 734.20 MM HG(29.26 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 65 PCT
ABSOLUTE HUMIDITY 13.2 GM/KG(92.1 GRAINS/LB) NOX HUMIDITY C.F. 1.0873

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	711.2 (28.0)	744.2 (29.3)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	459.7 (17.9)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8085	8318	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	178.8 (6315)	201.5 (7119)	206.1 (7280)	178.6 (6308)
HC SAMPLE METER/RANGE/PPM	18.8/ 3/ 188	20.4/ 3/ 204	21.1/ 3/ 211	21.5/ 3/ 215
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.2/ 3/ 12	1.2/ 3/ 12	1.2/ 3/ 12
CO SAMPLE METER/RANGE/PPM	37.0/ 3/ 1091	39.0/ 3/ 1150	69.9/ 3/ 2057	42.5/ 3/ 1252
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.5/ 3/ 15	.6/ 3/ 18	.5/ 3/ 15
CO2 SAMPLE METER/RANGE/PCT	16.0/ 3/ .26	26.6/ 3/ .44	62.3/ 3/ 1.10	16.0/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.0/ 3/ .05	2.0/ 3/ .03	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.1/ 2/ 10	29.1/ 2/ 29	94.3/ 2/ 94	10.6/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.9/ 2/ 0	.6/ 2/ 1
DILUTION FACTOR	35.21	23.55	10.17	33.58
HC CONCENTRATION PPM	177	193	200	203
CO CONCENTRATION PPM	1042	1101	1954	1205
CO2 CONCENTRATION PCT	.21	.39	1.07	.21
NOX CONCENTRATION PPM	9.9	28.8	93.9	10.0
HC MASS GRAMS	18.28	22.38	23.80	20.95
CO MASS GRAMS	217.03	258.51	469.09	250.69
CO2 MASS GRAMS	690.6	1451.0	4046.5	690.1
NOX MASS GRAMS	3.68	12.08	40.27	3.72
FUEL KG (LB)	.343 (.76)	.608 (1.34)	1.532 (3.38)	.363 (.80)
KW HR (HP HR)	.61 (.82)	1.39 (1.87)	4.36 (5.84)	.63 (.85)
BSHC G/KW HR (G/HP HR)	29.90 (22.30)	16.06 (11.98)	5.46 (4.07)	33.02 (24.62)
BSCO G/KW HR (G/HP HR)	354.94 (264.68)	185.58 (138.39)	107.63 (80.26)	395.06 (294.59)
BSCO2 G/KW HR (G/HP HR)	1129.40 (842.19)	1041.62 (776.74)	928.44 (692.34)	1087.67 (811.08)
BSNOX G/KW HR (G/HP HR)	6.02 (4.49)	8.67 (6.47)	9.24 (6.89)	5.87 (4.37)
BSFC KG/KW HR (LB/HP HR)	.562 (.924)	.436 (.717)	.351 (.578)	.572 (.940)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) 0.000 (0.00)
MULTIPLIER FOR G/TEST 0.000
MULTIPLIER FOR G/KW HR (G/HP HR) 0.0000 (0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) 0.0000 (0.0000)

20 X 20 FILTERS
SAMPLE FLOW SCM(SCF) 0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.00 (9.48)	
BSHC G/KW HR (G/HP HR)	12.21 (9.10)	
BSCO G/KW HR (G/HP HR)	170.82 (127.38)	
BSCO2 G/KW HR (G/HP HR)	983 (733)	
BSNOX G/KW HR (G/HP HR)	8.54 (6.37)	
BSFC KG/KW HR (LB/HP HR)	.807 (.669)	

TABLE B-7B. TEST 2-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH304
ENGINE MODEL 69
ENGINE 5.0 L(304 CID) V-8
CVS NO. 9

TEST NO. 2-2 RUN
DATE 10/10/78
TIME 03:10
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 742.20 MM HG(29.24 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 69 PCT
ABSOLUTE HUMIDITY 13.2 GM/KG(92.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.0872

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	711.2 (28.0)	744.2 (29.3)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	454.7 (17.9)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8318	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	178.7 (6311)	201.4 (7114)	206.0 (7274)	178.5 (6303)
HC SAMPLE METER/RANGE/PPM	46.8/ 3/ 468	23.9/ 3/ 239	18.3/ 3/ 183	10.3/ 3/ 103
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.7/ 3/ 17	1.4/ 3/ 14	1.1/ 3/ 11
CO SAMPLE METER/RANGE/PPM	49.5/ 3/ 1458	39.7/ 3/ 1170	64.7/ 3/ 1905	28.0/ 3/ 828
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.7/ 3/ 21	1.2/ 3/ 37	1.1/ 3/ 34
CO2 SAMPLE METER/RANGE/PCT	17.1/ 3/ .27	27.8/ 3/ .46	62.4/ 3/ 1.10	16.4/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.0/ 3/ .05	3.1/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	6.7/ 2/ 7	26.1/ 2/ 26	89.0/ 2/ 89	10.8/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.4/ 2/ 0	.4/ 2/ 0	1.0/ 2/ 1
DILUTION FACTOR	28.97	22.51	10.29	32.95
HC CONCENTRATION PPM	457	223	170	92
CO CONCENTRATION PPM	1394	1114	1790	774
CO2 CONCENTRATION PCT	.22	.41	1.06	.22
NOX CONCENTRATION PPM	6.5	25.7	88.6	9.8
HC MASS GRAMS	47.14	25.88	20.24	9.50
CO MASS GRAMS	290.11	261.19	429.23	160.78
CO2 MASS GRAMS	726.9	1528.1	3993.0	706.0
NOX MASS GRAMS	2.42	10.77	37.97	3.65
FUEL KG (LB)	.920 (.93)	.637 (1.40)	1.492 (3.29)	.312 (.69)
KW HR (HP HR)	.56 (.75)	1.38 (1.85)	4.36 (5.84)	.68 (.91)
BSHC G/KW HR (G/HP HR)	84.73 (63.18)	18.76 (13.99)	4.64 (3.46)	14.06 (10.48)
BSCO G/KW HR (G/HP HR)	521.51 (388.89)	183.38 (141.22)	98.49 (73.44)	232.90 (177.40)
BSCO2 G/KW HR (G/HP HR)	1306.79 (974.47)	1107.95 (826.20)	916.17 (683.19)	1044.66 (779.00)
BSNOX G/KW HR (G/HP HR)	4.35 (3.24)	7.81 (5.82)	8.71 (6.50)	5.40 (4.02)
BSFC KG/KW HR (LB/HP HR)	.755 (1.241)	.462 (.759)	.342 (.563)	.461 (.758)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) 0.000 (0.00)
MULTIPLIER FOR G/TEST 0.000
MULTIPLIER FOR G/KW HR (G/HP HR) 0.0000 (0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) 0.0000 (0.0000)

20 X 20 FILTERS
SAMPLE FLOW SCM(SCF) 0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		6.97 (9.35)
BSHC	G/KW HR (G/HP HR)	14.74 (10.99)
BSCO	G/KW HR (G/HP HR)	163.75 (122.11)
BSCO2	G/KW HR (G/HP HR)	998 (744)
BSNOX	G/KW HR (G/HP HR)	7.86 (5.86)
BSFC	KG/KW HR (LB/HP HR)	.410 (.675)

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TABLE B-7B (CONT'D). TEST 2-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH304
ENGINE MODEL 69
ENGINE 5.0 L(304 CID) V-8
CVS NO. 9

TEST NO. 2-2 RUN
DATE 10/10/78
TIME 0811D
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 742.20 MM HG(29.24 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 74 PCT
ABSOLUTE HUMIDITY 14.6 GM/KG(102.2 GRAINS/LB) NOX HUMIDITY C.F. 1.1963

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	703.6 (27.7)	711.2 (28.0)	744.2 (29.3)	713.7 (28.1)
BLOWER INLET P MM. H20(IN. H20)	459.7 (17.9)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8085	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	178.6 (6310)	201.4 (7113)	205.9 (7273)	178.4 (6302)
HC SAMPLE METER/RANGE/PPM	13.4/ 3/ 134	14.0/ 3/ 140	20.1/ 3/ 201	23.3/ 3/ 233
HC BCKGRD METER/RANGE/PPM	.9/ 3/ 9	.9/ 3/ 9	1.0/ 3/ 10	1.1/ 3/ 11
CO SAMPLE METER/RANGE/PPM	27.5/ 3/ 814	30.9/ 3/ 913	70.4/ 3/ 2072	43.2/ 3/ 1273
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.7/ 3/ 21	.7/ 3/ 21	.6/ 3/ 18
CO2 SAMPLE METER/RANGE/PCT	15.0/ 3/ .26	26.3/ 3/ .43	61.7/ 3/ 1.09	16.1/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.0/ 3/ .05	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.6/ 2/ 11	28.4/ 2/ 28	85.9/ 2/ 86	10.2/ 2/ 10
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.5/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	38.51	25.08	10.26	33.16
HC CONCENTRATION PPM	125	131	192	222
CO CONCENTRATION PPM	770	863	1960	1218
CO2 CONCENTRATION PCT	.21	.39	1.09	.21
NOX CONCENTRATION PPM	10.3	28.1	85.9	9.5
HC MASS GRAMS	12.90	15.26	22.80	22.88
CO MASS GRAMS	160.17	202.49	469.96	253.18
CO2 MASS GRAMS	689.7	1430.1	3934.9	685.2
NOX MASS GRAMS	4.04	12.42	38.58	3.73
FUEL KG (LB)	.310 (.68)	.566 (1.25)	1.496 (3.30)	.364 (.80)
KW HR (HP HR)	.63 (.85)	1.39 (1.87)	4.38 (5.87)	.61 (.82)
BSHC G/KW HR (G/HP HR)	20.39 (15.17)	10.95 (8.17)	5.21 (3.88)	37.42 (27.91)
BSCO G/KW HR (G/HP HR)	252.96 (188.26)	145.36 (108.40)	107.38 (80.07)	414.06 (308.77)
BSCO2 G/KW HR (G/HP HR)	1087.10 (810.65)	1026.65 (765.57)	899.06 (670.43)	1120.55 (835.59)
BSNOX G/KW HR (G/HP HR)	6.36 (4.75)	8.91 (6.65)	8.82 (6.57)	6.09 (4.54)
BSFC KG/KW HR (LB/HP HR)	.488 (.802)	.407 (.668)	.342 (.562)	.596 (.979)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.02 (	9.41)
BSHC G/KW HR (G/HP HR)	10.53 (	7.85)
BSCO G/KW HR (G/HP HR)	154.77 (	115.41)
BSCO2 G/KW HR (G/HP HR)	961 (	716)
BSNOX G/KW HR (G/HP HR)	8.48 (	6.25)
BSFC KG/KW HR (LB/HP HR)	.390 (	.641)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-8A. TEST 3-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH345
ENGINE MODEL 69 IH-345
ENGINE 5.7 L(345 CID) V-8
CVS NO. 9

TEST NO.3-1 RUN
DATE 10/30/78
TIME 09:20
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 27.8 DEG C(82.0 DEG F)

RELATIVE HUMIDITY 29 PCT
ABSOLUTE HUMIDITY 6.9 GM/KG(48.4 GRAINS/LB) NOX HUMIDITY C.F. .8890

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8088	8320	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	179.4 (6338)	202.1 (7140)	206.5 (7294)	179.1 (6326)
HC SAMPLE METER/RANGE/PPM	93.1/ 3/ 431	20.6/ 3/ 206	17.3/ 3/ 173	12.5/ 3/ 125
HC BCKGRD METER/RANGE/PPM	.8/ 3/ 8	1.4/ 3/ 14	1.1/ 3/ 11	1.2/ 3/ 12
CO SAMPLE METER/RANGE/PPM	27.6/ 3/ 817	25.1/ 3/ 744	45.6/ 3/ 1393	18.0/ 3/ 536
CO BCKGRD METER/RANGE/PPM	1.1/ 3/ 34	1.0/ 3/ 31	1.3/ 3/ 40	1.3/ 3/ 40
CO2 SAMPLE METER/RANGE/PCT	17.6/ 3/ .28	27.6/ 3/ .45	63.5/ 3/ 1.12	14.7/ 3/ .23
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOx SAMPLE METER/RANGE/PPM	9.4/ 2/ 9	36.8/ 2/ 37	50.3/ 3/ 151	13.7/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.1/ 3/ 0	.9/ 2/ 0
DILUTION FACTOR	33.01	24.44	10.55	44.78
HC CONCENTRATION PPM	423	193	163	113
CO CONCENTRATION PPM	772	701	1266	490
CO2 CONCENTRATION PCT	.24	.41	1.08	.19
NOX CONCENTRATION PPM	9.1	36.5	150.6	13.3
HC MASS GRAMS	43.80	22.45	19.42	11.70
CO MASS GRAMS	161.35	165.06	309.37	102.28
CO2 MASS GRAMS	781.6	1525.5	4095.9	624.8
NOX MASS GRAMS	2.78	12.55	52.90	4.05
FUEL KG (LB)	.370 (.82)	.585 (1.29)	1.461 (3.22)	.259 (.57)
KW HR (HP HR)	.44 (.59)	1.28 (1.72)	4.45 (5.97)	.56 (.75)
BSHC G/KW HR (G/HP HR)	99.02 (73.84)	17.51 (13.06)	4.36 (3.25)	20.90 (15.59)
BSCO G/KW HR (G/HP HR)	364.75 (272.00)	128.75 (96.01)	68.39 (51.00)	182.74 (136.27)
BSCO2 G/KW HR (G/HP HR)	1766.93 (1317.60)	1184.95 (887.34)	920.27 (686.25)	1116.24 (832.38)
BSNOX G/KW HR (G/HP HR)	6.28 (4.69)	9.79 (7.30)	11.89 (8.86)	7.24 (5.40)
BSFC KG/KW HR (LB/HP HR)	.837 (1.376)	.456 (.750)	.328 (.540)	.463 (.762)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.73	(9.03)
BSHC G/KW HR (G/HP HR)	14.46	(10.78)
BSCO G/KW HR (G/HP HR)	108.85	(81.17)
BSCO2 G/KW HR (G/HP HR)	1044	(779)
BSNOX G/KW HR (G/HP HR)	10.73	(8.00)
BSFC KG/KW HR (LB/HP HR)	.397	(.653)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE B-8A (CONT'D). TEST 3-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH345
ENGINE MODEL 69 IH 345
ENGINE 5.7 L(345 CID) V-8
CVS NO. 9

TEST NO.3-1 RUN
DATE 10/30/78
TIME 09:20
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 36 PCT
ABSOLUTE HUMIDITY 6.8 GM/KG(47.4 GRAINS/LB)

NOX HUMIDITY C.F. .8851

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8084	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	179.4 (6335)	202.0 (7136)	206.4 (7290)	179.0 (6324)
HC SAMPLE METER/RANGE/PPM	15.4/ 3/ 154	14.4/ 3/ 144	17.2/ 3/ 172	14.7/ 3/ 147
HC BCKGRD METER/RANGE/PPM	1.6/ 3/ 16	1.2/ 3/ 12	.9/ 3/ 9	1.1/ 3/ 11
CO SAMPLE METER/RANGE/PPM	19.3/ 3/ 579	29.0/ 3/ 857	55.3/ 3/ 1628	24.9/ 3/ 738
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	.6/ 3/ 18	1.1/ 3/ 34	1.4/ 3/ 43
CO2 SAMPLE METER/RANGE/PCT	13.2/ 3/ .21	25.0/ 3/ .41	62.5/ 3/ 1.10	14.1/ 3/ .22
CO2 BCKGRD METER/RANGE/PCT	2.4/ 3/ .04	2.3/ 3/ .04	2.5/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.0/ 2/ 10	31.1/ 2/ 31	96.7/ 3/ 140	12.2/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.4/ 2/ 0	.3/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	47.69	26.40	10.48	43.05
HC CONCENTRATION PPM	138	132	164	136
CO CONCENTRATION PPM	548	823	1545	685
CO2 CONCENTRATION PCT	.17	.38	1.07	.18
NOX CONCENTRATION PPM	9.6	30.7	139.3	11.4
HC MASS GRAMS	14.31	15.44	19.51	14.07
CO MASS GRAMS	114.38	193.70	371.31	142.80
CO2 MASS GRAMS	568.8	1388.9	4040.6	582.2
NOX MASS GRAMS	2.92	10.51	48.68	3.96
FUEL KG (LB)	.250 (.55)	.549 (1.21)	1.477 (3.26)	.268 (.59)
KW HR (HP HR)	.41 (.54)	1.29 (1.73)	4.40 (5.90)	.55 (.73)
BSHC G/KW HR (G/HP HR)	35.23 (26.27)	11.96 (8.92)	4.43 (3.31)	25.76 (19.21)
BSCO G/KW HR (G/HP HR)	281.54 (209.95)	150.09 (111.89)	84.37 (62.91)	261.44 (194.96)
BSCO2 G/KW HR (G/HP HR)	1400.09 (1044.04)	1075.86 (802.27)	918.08 (684.62)	1065.94 (794.87)
BSNOX G/KW HR (G/HP HR)	7.18 (5.36)	8.14 (6.07)	11.06 (8.25)	6.34 (4.73)
BSFC KG/KW HR (LB/HP HR)	.616 (1.013)	.425 (.699)	.336 (.552)	.491 (.808)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.64 (	8.91)
BSHC G/KW HR (G/HP HR)	9.53 (	7.11)
BSCO G/KW HR (G/HP HR)	123.74 (	92.27)
BSCO2 G/KW HR (G/HP HR)	990 (	739)
BSNOX G/KW HR (G/HP HR)	9.87 (	7.36)
BSFC KG/KW HR (LB/HP HR)	.383 (	.630)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-8B. TEST 3-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH345
ENGINE MODEL 69
ENGINE 5.7 L(345 CID) V-8
CVS NO. 9

TEST NO.3-2 RUN
DATE 11/ 1/78
TIME 08:40
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 40 PCT
ABSOLUTE HUMIDITY 7.3 GM/KG(51.0 GRAINS/LB)

NOX HUMIDITY C.F. .8986

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8087	8319	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.2 (6365)	203.0 (7170)	207.4 (7325)	179.9 (6353)
HC SAMPLE METER/RANGE/PPM	43.0/ 3/ 430	20.9/ 3/ 209	15.9/ 3/ 159	12.0/ 3/ 120
HC BCKGRD METER/RANGE/PPM	.8/ 3/ 8	1.7/ 3/ 17	1.0/ 3/ 10	.9/ 3/ 9
CO SAMPLE METER/RANGE/PPM	20.7/ 3/ 615	22.6/ 3/ 671	41.4/ 3/ 1220	16.7/ 3/ 498
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 6	.6/ 3/ 18	1.1/ 3/ 34	1.4/ 3/ 43
CO2 SAMPLE METER/RANGE/PCT	14.9/ 3/ .24	28.0/ 3/ .46	65.0/ 3/ 1.15	14.6/ 3/ .23
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .05	2.5/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	6.7/ 2/ 7	36.6/ 2/ 37	51.0/ 3/ 153	12.3/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.3/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	39.34	24.44	10.42	45.71
HC CONCENTRATION PPM	422	193	150	111
CO CONCENTRATION PPM	599	639	1147	448
CO2 CONCENTRATION PCT	.19	.42	1.12	.19
NOX CONCENTRATION PPM	6.2	36.1	152.2	11.5
HC MASS GRAMS	43.89	22.56	17.94	11.54
CO MASS GRAMS	125.63	151.00	276.99	93.89
CO2 MASS GRAMS	640.1	1552.6	4247.7	631.9
NOX MASS GRAMS	1.92	12.60	54.26	3.56
FUEL KG (LB)	.308 (.68)	.587 (1.29)	1.494 (3.29)	.257 (.57)
KW HR (HP HR)	.21 (.28)	1.27 (1.71)	4.43 (5.94)	.54 (.73)
BSHC G/KW HR (G/HP HR)	211.36 (157.61)	17.72 (13.22)	4.05 (3.02)	21.30 (15.88)
BSCO G/KW HR (G/HP HR)	605.04 (451.17)	118.63 (88.46)	62.55 (46.64)	173.34 (129.26)
BSCO2 G/KW HR (G/HP HR)	3082.86 (2298.89)	1219.70 (909.53)	959.24 (715.31)	1166.51 (869.86)
BSNOX G/KW HR (G/HP HR)	9.27 (6.91)	9.90 (7.38)	12.25 (9.14)	6.57 (4.90)
BSFC KG/KW HR (LB/HP HR)	1.483 (2.438)	.461 (.758)	.337 (.555)	.475 (.781)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.45	(8.65)
BSHC G/KW HR (G/HP HR)	14.87	(11.09)
BSCO G/KW HR (G/HP HR)	100.38	(74.86)
BSCO2 G/KW HR (G/HP HR)	1096	(818)
BSNOX G/KW HR (G/HP HR)	11.22	(8.36)
BSFC KG/KW HR (LB/HP HR)	.410	(.624)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-8B (CONT'D). TEST 3-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH345
ENGINE MODEL 69
ENGINE 5.7 L(345 CID) V-8
CVS NO. 9

TEST NO.3-2 RUN
DATE 11/ 1/78
TIME
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 748.28 MM HG(29.46 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0527

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
BLOWER INLET P MM. H2O(IN. H2O)	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8163	8516	7241
TIME SECONDS	272.0	310.0	323.6	275.0
TOTAL FLOW STD. CU. METRES(SCF)	180.1 (6363)	204.9 (7237)	212.3 (7499)	181.8 (6422)
HC SAMPLE METER/RANGE/PPM	19.8/ 3/ 198	14.6/ 3/ 146	19.1/ 3/ 191	10.1/ 3/ 101
HC BCKGRD METER/RANGE/PPM	5.2/ 3/ 52	4.8/ 3/ 48	4.2/ 3/ 42	4.3/ 3/ 43
CO SAMPLE METER/RANGE/PPM	20.9/ 3/ 621	33.0/ 3/ 974	63.5/ 3/ 1870	21.9/ 3/ 650
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	.4/ 3/ 12	.9/ 3/ 28	1.1/ 3/ 34
CO2 SAMPLE METER/RANGE/PCT	15.2/ 3/ .24	24.8/ 3/ .41	62.1/ 3/ 1.10	14.4/ 3/ .23
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.8/ 3/ .04	2.9/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.1/ 2/ 13	28.6/ 2/ 29	39.6/ 3/ 119	11.6/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	1.2/ 2/ 1	1.2/ 2/ 1	.1/ 3/ 0	.6/ 2/ 1
DILUTION FACTOR	41.53	26.01	10.35	44.30
HC CONCENTRATION PPM	147	100	153	59
CO CONCENTRATION PPM	589	937	1770	603
CO2 CONCENTRATION PCT	.20	.36	1.06	.19
NOX CONCENTRATION PPM	11.9	27.4	118.5	11.2
HC MASS GRAMS	15.30	11.80	18.74	6.18
CO MASS GRAMS	123.54	223.47	437.71	127.66
CO2 MASS GRAMS	671.0	1367.8	4103.9	617.7
NOX MASS GRAMS	4.33	11.32	50.67	4.11
FUEL KG (LB)	.288 (.64)	.554 (1.22)	1.529 (3.37)	.264 (.58)
KW HR (HP HR)	.54 (.72)	1.28 (1.72)	4.47 (6.00)	.55 (.74)
BSHC G/KW HR (G/HP HR)	28.48 (21.24)	9.21 (6.86)	4.19 (3.12)	11.23 (8.37)
BSCO G/KW HR (G/HP HR)	229.99 (171.50)	174.32 (129.99)	97.85 (72.97)	231.81 (172.86)
BSCO2 G/KW HR (G/HP HR)	1249.23 (931.55)	1067.00 (795.66)	917.43 (684.13)	1121.72 (836.46)
BSNOX G/KW HR (G/HP HR)	8.06 (6.01)	8.83 (6.59)	11.33 (8.45)	7.46 (5.56)
BSFC KG/KW HR (LB/HP HR)	.536 (.882)	.432 (.710)	.342 (.562)	.480 (.789)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.84 (9.18)
BSHC G/KW HR (G/HP HR)	7.60 (5.67)
BSCO G/KW HR (G/HP HR)	133.33 (99.42)
BSCO2 G/KW HR (G/HP HR)	988 (737)
BSNOX G/KW HR (G/HP HR)	10.29 (7.67)
BSFC KG/KW HR (LB/HP HR)	.385 (.633)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-9A. TEST 4-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

TEST NO. 4-1 RUN
DATE 11/17/77
TIME 09:15 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

RELATIVE HUMIDITY 26. PCT
ABSOLUTE HUMIDITY 5.3 GM/KG(36.8 GRAINS/LB) — NOX HUMIDITY C.F. .8478

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
DISTANCE MILES (KM)	3.59 (5.77)	3.59 (5.77)	3.59 (5.77)	3.59 (5.77)
AVG SPEED MPH (KPH)	19.7 (31.7)	19.2 (30.9)	17.1 (27.5)	19.2 (30.9)
MAX SPEED MPH (KPH)	56.8 (91.4)	56.8 (91.4)	56.8 (91.4)	56.8 (91.4)
ABS HUMIDITY GR/LB (G/KG)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
EXHAUST SAMPLES	7168.	8090.	8322.	7166.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. FT (STD CUM)	179.5 (6341.)	202.3 (7144.)	206.6 (7299.)	179.2 (6330.)
HC SAMPLE PPM/ANALYZER PPM	39.0/ 3/ 390.	18.4/ 3/ 184.	19.3/ 3/ 193.	14.5/ 3/ 145.
HC BERGER PPM/ANALYZER PPM	1.2/ 3/ 12.	1.3/ 3/ 13.	1.2/ 3/ 12.	1.8/ 3/ 18.
CO SAMPLE PPM/ANALYZER PPM	35.9/ 3/ 849.	37.8/ 3/ 898.	72.3/ 3/1897.	34.9/ 3/ 824.
CO BERGER PPM/ANALYZER PPM	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.
CO2 SAMPLE PCT/ANALYZER PCT	13.2/ 3/ .21	24.3/ 3/ .40	57.0/ 3/ 1.00	13.7/ 3/ .22
CO2 BERGER PCT/ANALYZER PCT	3.2/ 3/ .05	3.4/ 3/ .05	4.1/ 3/ .06	3.5/ 3/ .05
NOX SAMPLE PPM/ANALYZER PPM	5.9/ 2/ 6.	28.2/ 2/ 28.	35.7/ 3/ 107.	10.4/ 2/ 10.
NOX BERGER PPM/ANALYZER PPM	1.4/ 2/ 1.	1.0/ 2/ 1.	.4/ 3/ 1.	1.1/ 2/ 1.
DILUTION FACTOR	40.48	26.69	11.10	42.92
HC CORRECTED PPM	378.	171.	182.	127.
CO CORRECTED PPM	836.	881.	1842.	811.
CO2 CORRECTED PCT	.16	.35	.95	.16
NOX CORRECTED PPM	4.5	27.2	106.0	9.3
HC MASS GRAMS	39.17	20.01	21.70	13.17
CO MASS GRAMS	174.80	207.49	443.27	169.25
CO2 MASS GRAMS	527.4	1279.1	3581.1	538.3
NOX MASS GRAMS	1.32	8.93	35.52	2.71
FUEL KG (LB)	.292 (.64)	.526 (1.16)	1.370 (3.02)	.267 (.59)
AIR KG (LB)	.28 (.35)	1.26 (1.69)	4.36 (5.84)	.52 (.70)
HSEF G/KW HR (G/HP HR)	139.96 (104.37)	15.89 (11.85)	4.98 (3.72)	25.15 (18.76)
HSEC G/KW HR (G/HP HR)	624.59 (465.76)	164.76 (122.86)	101.76 (75.88)	323.23 (241.03)
HSEI G/KW HR (G/HP HR)	1884.62 (1405.36)	1015.63 (757.35)	822.12 (613.06)	1028.11 (766.66)
BSNOX G/KG FUEL (G/LB FUEL)	4.72 (3.52)	7.09 (5.29)	8.16 (6.08)	5.18 (3.86)
BSFC KG/KW HR (LB/HP HR)	1.043 (1.715)	.418 (.687)	.315 (.517)	.509 (.837)

TOTAL TEST RESULTS

PARTICULATE DATA, TOTAL FOR 4 BAGS

TOTAL MASS (GRAMS)	4.42 (8.61)	
BSPM G/KW HR (G/HP HR)	14.99 (10.99)	
BSPC G/KW HR (G/HP HR)	114.57 (85.47)	
BSPI G/KW HR (G/HP HR)	93.8 (69.9)	
BSPM G/KG FUEL (G/LB FUEL)	2.65 (1.20)	
BSFC KG/KW HR (LB/HP HR)	.564 (.927)	

90MM FILTER

SAMPLE FLOW SCM(SCF)	0.000 (0.00)	
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000 (0.0000)	
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)	

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00 (0.0)	

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TABLE B-9A (CONT'D). TEST 4-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO. 4-1 RUN
DATE 11/17/77
TIME 09:15
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

RELATIVE HUMIDITY 24. PCT
ABSOLUTE HUMIDITY 5.7 GM/KG(39.9 GRAINS/LB) NOX HUMIDITY C.F. .8584

	1 NYNF	2 LANF	3 LAF	4 NYNF
	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
	55.0 (131.0)	55.0 (131.0)	55.0 (131.0)	55.0 (131.0)
	7168.	8090.	8322.	7494.
	272.0	307.0	316.0	284.4
	179.2 (6331.)	202.0 (7133.)	206.3 (7287.)	187.1 (6609.)
	15.7/ 3/ 157.	16.4/ 3/ 164.	20.6/ 3/ 206.	16.5/ 3/ 165.
	1.3/ 3/ 13.	1.1/ 3/ 11.	1.3/ 3/ 13.	1.2/ 3/ 12.
	30.3/ 3/ 709.	40.6/ 3/ 970.	79.8/ 3/2153.	35.4/ 3/ 836.
	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.
	13.7/ 3/ .22	22.9/ 3/ .37	56.0/ 3/ .98	13.4/ 3/ .21
	3.5/ 3/ .05	3.1/ 3/ .05	3.6/ 3/ .06	3.6/ 3/ .06
	10.3/ 2/ 10.	26.4/ 2/ 26.	35.5/ 3/ 107.	10.9/ 2/ 11.
	1.1/ 2/ 1.	1.1/ 2/ 1.	.5/ 3/ 2.	1.6/ 2/ 2.
	44.35	27.73	11.04	43.14
	144.	153.	194.	153.
	698.	953.	2094.	824.
	.16	.33	.93	.16
	9.2	25.3	105.1	9.3
	14.92	17.87	23.11	16.54
	145.68	224.21	502.99	179.58
	538.3	1203.8	3527.9	540.0
	2.7	8.40	35.62	2.87
	.25/ (.57)	.508 (1.12)	1.384 (3.05)	.276 (.61)
	.51 (.66)	1.26 (1.69)	4.35 (5.84)	.51 (.69)
	29.25 (21.81)	14.19 (10.58)	5.31 (3.96)	32.15 (23.97)
	285.60 (212.97)	178.03 (132.76)	115.59 (86.20)	348.98 (260.23)
	1055.30 (786.94)	955.87 (712.79)	810.75 (604.57)	1049.41 (782.55)
	5.32 (3.97)	6.67 (4.98)	8.19 (6.10)	5.58 (4.16)
	.503 (.828)	.404 (.664)	.318 (.523)	.536 (.881)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)	
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)	
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)	
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)	

TABLE B-9B. TEST 4-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

TEST NO. 4-3 RUN
DATE 11/21/77
TIME 08:40 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

RELATIVE HUMIDITY 38. PCT
ABSOLUTE HUMIDITY 6.7 GM/KG(46.7 GRAINS/LB) — NOX HUMIDITY C.F. .8826

	1 NYNF	2 LANF	3 LAF	4 NYNF
	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
	452.1 (17.8)	462.3 (18.2)	515.6 (20.3)	462.3 (18.2)
	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
	7170.	8091.	8323.	7166.
	271.9	307.0	316.0	272.0
	160.2 (6366.)	203.1 (7173.)	207.4 (7326.)	179.9 (6353.)
	43.3/ 3/ 433.	22.6/ 3/ 226.	21.3/ 3/ 213.	20.1/ 3/ 201.
	1.9/ 3/ 19.	1.9/ 3/ 19.	1.9/ 3/ 19.	1.7/ 3/ 17.
	35.0/ 3/ 826.	41.2/ 3/ 986.	75.4/ 3/2001.	36.4/ 3/ 862.
	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.
	12.2/ 3/ .19	24.3/ 3/ .40	56.3/ 3/ .99	13.4/ 3/ .21
	3.2/ 3/ .05	3.4/ 3/ .05	3.4/ 3/ .05	3.4/ 3/ .05
	5.4/ 2/ 5.	29.5/ 2/ 30.	36.4/ 3/ 109.	11.3/ 2/ 11.
	.9/ 2/ 1.	1.0/ 2/ 1.	.4/ 3/ 1.	1.3/ 2/ 1.
	42.34	26.04	11.12	42.36
	414.	208.	196.	184.
	811.	964.	1936.	845.
	.14	.35	.94	.16
	4.5	28.5	108.1	10.0
	43.08	24.33	23.41	19.13
	170.15	227.98	467.62	177.07
	475.4	1284.4	3579.9	529.1
	1.38	9.79	37.86	3.05
	.277 (.61)	.542 (1.20)	1.384 (3.05)	.274 (.60)
	.22 (.27)	1.25 (1.68)	4.38 (5.87)	.51 (.68)
	196.45 (148.28)	19.46 (14.51)	5.35 (3.99)	37.51 (27.97)
	785.31 (585.60)	182.33 (135.96)	106.80 (79.64)	347.14 (258.87)
	2194.34 (1636.32)	1027.26 (766.03)	817.61 (609.69)	1037.35 (773.55)
	6.35 (4.74)	7.83 (5.84)	8.65 (6.45)	5.97 (4.45)
	1.280 (2.104)	.434 (.713)	.316 (.519)	.536 (.882)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE B-9B (CONT'D). TEST 4-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO. 4-3 RUN

DATE 11/21/77

TIME 09:20

GASOLINE EM-267-F

DYNO NO. 2

BAG CART NO. 1

RELATIVE HUMIDITY 34. PCT

ABSOLUTE HUMIDITY 7.0 GM/KG(49.0 GRAINS/LB) NOX HUMIDITY C.F. .8911

	1 NYNF	2 LANF	3 LAF	4 NYNF
	703.6 (27.7)	713.7 (28.1)	756.9 (29.8)	713.7 (28.1)
	452.1 (17.8)	464.8 (18.3)	515.6 (20.3)	462.3 (18.2)
	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
	7167.	8088.	8320.	7165.
	272.6	307.0	316.0	272.0
	180.2 (6363.)	203.0 (7169.)	207.3 (7324.)	179.8 (6352.)
	18.6/ 3/ 166.	17.8/ 3/ 178.	21.3/ 3/ 213.	19.3/ 3/ 193.
	1.7/ 3/ 17.	1.7/ 3/ 17.	1.7/ 3/ 17.	1.6/ 3/ 16.
	31.7/ 3/ 743.	40.5/ 3/ 967.	79.3/ 3/2136.	37.1/ 3/ 880.
	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.
	13.3/ 3/ .21	22.6/ 3/ .37	57.2/ 3/ 1.01	13.6/ 3/ .21
	3.5/ 3/ .05	3.2/ 3/ .05	3.5/ 3/ .05	3.4/ 3/ .05
	10.8/ 2/ 11.	27.1/ 2/ 27.	37.3/ 3/ 112.	11.1/ 2/ 11.
	1.3/ 2/ 1.	1.3/ 2/ 1.	.3/ 3/ 1.	1.3/ 2/ 1.
	44.42	27.98	10.84	41.78
	169.	162.	198.	177.
	730.	948.	2069.	864.
	.16	.32	.96	.16
	9.5	25.8	111.1	9.8
	17.60	18.92	23.63	18.40
	153.14	224.03	499.52	180.97
	519.4	1185.0	3641.0	539.9
	2.93	8.94	39.26	3.01
	.257 (.57)	.503 (1.11)	1.419 (3.13)	.278 (.61)
	.51 (.63)	1.26 (1.69)	4.39 (5.89)	.51 (.68)
	34.51 (25.73)	14.97 (11.16)	5.38 (4.01)	36.40 (27.14)
	300.24 (223.89)	177.25 (132.18)	113.73 (84.81)	357.96 (266.93)
	1018.22 (759.24)	937.59 (699.16)	828.99 (618.18)	1067.94 (796.36)
	5.74 (4.28)	7.07 (5.28)	8.94 (6.67)	5.96 (4.45)
	.509 (.829)	.398 (.655)	.323 (.531)	.550 (.905)

PARTICULATE DATA, TOTAL FOR 4 BAGS

96MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.01)

TABLE B-10A. TEST 5-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL 69 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 5-3 RUN
DATE 12/19/78
TIME 08130
DYNO NO. 2
GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)
RELATIVE HUMIDITY 33 PCT
ABSOLUTE HUMIDITY 7.3 GM/KG(51.3 GRAINS/LB)
NOX HUMIDITY C.F. .8997

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	670.6 (26.4)	685.8 (27.0)	726.4 (28.6)	685.8 (27.0)
BLOWER INLET P MM. H2O(IN. H2O)	444.5 (17.5)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7168	8089	8320	7164
TIME SECONDS	272.0	307.0	315.9	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.4 (6441)	205.4 (7254)	210.2 (7423)	181.9 (6426)
HC SAMPLE METER/RANGE/PPM	41.1/ 3/ 411	36.0/ 3/ 360	34.7/ 3/ 347	26.4/ 3/ 264
HC BCKGRD METER/RANGE/PPM	1.8/ 3/ 18	1.8/ 3/ 18	1.7/ 3/ 17	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	36.7/ 3/ 1082	69.7/ 3/ 2051	79.6/ 2/ 5170	39.7/ 3/ 1170
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	.7/ 3/ 21	.1/ 2/ 6	.7/ 3/ 21
CO2 SAMPLE METER/RANGE/PCT	16.8/ 3/ .27	29.5/ 3/ .49	62.0/ 3/ 1.09	15.8/ 3/ .25
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.6/ 3/ .04	2.4/ 3/ .04	2.2/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	6.6/ 2/ 7	23.1/ 2/ 23	40.0/ 2/ 40	8.6/ 2/ 9
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	32.17	18.48	8.23	34.03
HC CONCENTRATION PPM	394	343	332	247
CO CONCENTRATION PPM	1048	1990	5001	1131
CO2 CONCENTRATION PCT	.22	.45	1.06	.22
NOX CONCENTRATION PPM	6.1	22.5	39.3	7.6
HC MASS GRAMS	41.40	40.63	40.25	25.97
CO MASS GRAMS	222.47	476.02	1223.87	239.71
CO2 MASS GRAMS	749.6	1644.6	4085.1	731.7
NOX MASS GRAMS	1.92	7.96	14.21	2.39
FUEL KG (LB)	.388 (.86)	.811 (1.79)	1.934 (4.26)	.375 (.83)
KW HR (HP HR)	.26 (.35)	1.43 (1.92)	5.14 (6.89)	.56 (.75)
BSHC G/KW HR (G/HP HR)	157.48 (117.44)	28.33 (21.12)	7.83 (5.84)	46.16 (34.42)
BSCO G/KW HR (G/HP HR)	846.32 (631.10)	331.90 (247.50)	238.23 (177.65)	426.05 (317.71)
BSCO2 G/KW HR (G/HP HR)	2851.69 (2126.50)	1181.55 (881.08)	795.18 (592.97)	1300.60 (969.86)
BSNOX G/KW HR (G/HP HR)	7.30 (5.45)	5.55 (4.14)	2.77 (2.06)	4.25 (3.17)
BSFC KG/KW HR (LB/HP HR)	1.476 (2.426)	.565 (.929)	.377 (.619)	.667 (1.097)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.40 (	9.92)
BSHC G/KW HR (G/HP HR)	20.04 (	14.95)
BSCO G/KW HR (G/HP HR)	292.29 (	217.96)
BSCO2 G/KW HR (G/HP HR)	982 (	732)
BSNOX G/KW HR (G/HP HR)	3.58 (	2.67)
BSFC KG/KW HR (LB/HP HR)	.474 (	.780)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-10A (CONT'D). TEST 5-3 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL 69 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 5-3 RUN
DATE 12/19/78
TIME 09:06 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 740.92 MM HG(29.17 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 37 PCT
ABSOLUTE HUMIDITY 7.3 GM/KG(51.1 GRAINS/LB) — NOX HUMIDITY C.F. .8990

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	668.0 (26.3)	683.3 (26.9)	726.4 (28.6)	685.8 (27.0)
BLOWER INLET P MM. H2O(IN. H2O)	444.5 (17.5)	457.2 (18.0)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.3 (6439)	205.4 (7255)	210.1 (7419)	181.4 (6425)
HC SAMPLE METER/RANGE/PPM	44.2/ 3/ 442	23.4/ 3/ 234	30.7/ 3/ 307	20.3/ 3/ 203
HC BCKGRD METER/RANGE/PPM	1.7/ 3/ 17	1.8/ 3/ 18	1.8/ 3/ 18	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	37.1/ 3/ 1044	61.4/ 3/ 1808	71.7/ 2/ 4656	33.0/ 3/ 924
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.8/ 3/ 24	.2/ 2/ 12	.9/ 3/ 28
CO2 SAMPLE METER/RANGE/PCT	15.4/ 3/ .25	27.7/ 3/ .46	61.7/ 3/ 1.09	16.4/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	1.6/ 3/ .02	1.5/ 3/ .02	1.7/ 3/ .03	1.7/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	9.2/ 2/ 9	19.3/ 2/ 19	51.7/ 2/ 52	9.5/ 2/ 10
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	.9/ 2/ 1	1.0/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	33.73	20.40	8.54	35.42
HC CONCENTRATION PPM	426	217	291	186
CO CONCENTRATION PPM	1055	1747	4492	931
CO2 CONCENTRATION PCT	.22	.43	1.06	.24
NOX CONCENTRATION PPM	8.3	18.4	50.8	8.5
HC MASS GRAMS	44.74	25.69	35.27	19.56
CO MASS GRAMS	223.97	417.93	1098.81	197.22
CO2 MASS GRAMS	740.7	1635.0	4096.4	784.7
NOX MASS GRAMS	2.61	6.51	18.36	2.67
FUEL KG (LB)	.389 (.86)	.748 (1.65)	1.871 (4.12)	.366 (.81)
KW HR (HP HR)	.56 (.75)	1.46 (1.96)	5.12 (6.87)	.56 (.75)
BSHC G/KW HR (G/HP HR)	80.18 (59.79)	17.58 (13.11)	6.88 (5.13)	34.77 (25.93)
BSCO G/KW HR (G/HP HR)	401.37 (299.30)	285.89 (213.19)	214.46 (159.93)	350.54 (261.40)
BSCO2 G/KW HR (G/HP HR)	1327.45 (989.88)	1118.42 (834.01)	799.53 (596.21)	1403.60 (1046.67)
BSNOX G/KW HR (G/HP HR)	4.68 (3.49)	4.46 (3.32)	3.58 (2.67)	4.74 (3.54)
BSFC KG/KW HR (LB/HP HR)	.697 (1.147)	.512 (.841)	.365 (.600)	.651 (1.070)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.71 (10.33)
BSHC G/KW HR (G/HP HR)	16.26 (12.12)
BSCO G/KW HR (G/HP HR)	251.48 (187.53)
BSCO2 G/KW HR (G/HP HR)	942 (703)
BSNOX G/KW HR (G/HP HR)	3.91 (2.92)
BSFC KG/KW HR (LB/HP HR)	.438 (.720)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) 0.000 (0.00)
MULTIPLIER FOR G/TEST 0.000
MULTIPLIER FOR G/KW HR (G/HP HR) 0.0000 (0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) 0.0000 (0.0000)

20 X 20 FILTERS
SAMPLE FLOW SCM(SCF) 0.00 (0.0)

TABLE B-10B. TEST 5-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL 69 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 5-4 RUN
DATE 12/20/78
TIME 08:49
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.58 MM HG(28.96 IN HG)
DRY BULB TEMP. 29.4 DEG C(85.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 10.1 GM/KG(71.0 GRAINS/LB)

NOX HUMIDITY C.F. .9815

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	670.6 (26.4)	685.8 (27.0)	726.4 (28.6)	685.8 (27.0)
BLOWER INLET P MM. H2O(IN. H2O)	444.5 (17.5)	462.3 (18.2)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8086	8317	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.9 (6391)	203.7 (7196)	208.5 (7363)	180.5 (6376)
HC SAMPLE METER/RANGE/PPM	41.5/ 3/ 415	32.5/ 3/ 325	31.6/ 3/ 316	18.2/ 3/ 182
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15	1.8/ 3/ 18	1.8/ 3/ 18	1.8/ 3/ 18
CO SAMPLE METER/RANGE/PPM	39.4/ 3/ 1176	74.8/ 3/ 2200	78.1/ 2/ 5073	36.7/ 3/ 1082
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.9/ 3/ 28	.3/ 2/ 18	.7/ 3/ 21
CO2 SAMPLE METER/RANGE/PCT	17.2/ 3/ .28	31.4/ 3/ .52	67.0/ 3/ 1.19	17.4/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	6.2/ 2/ 6	18.4/ 2/ 18	58.2/ 2/ 58	8.4/ 2/ 9
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.4/ 2/ 0	.6/ 2/ 1
DILUTION FACTOR	30.97	17.42	7.82	32.53
HC CONCENTRATION PPM	400	308	300	165
CO CONCENTRATION PPM	1132	2125	4878	1042
CO2 CONCENTRATION PCT	.23	.48	1.16	.25
NOX CONCENTRATION PPM	6.1	18.3	57.9	8.3
HC MASS GRAMS	41.79	36.20	36.11	17.13
CO MASS GRAMS	238.45	504.10	1184.22	219.12
CO2 MASS GRAMS	776.1	1807.4	4426.6	818.0
NOX MASS GRAMS	2.07	7.00	22.64	2.82
FUEL KG (LB)	.905 (.89)	.856 (1.89)	2.018 (4.45)	.389 (.85)
KW HR (HP HR)	.29 (.33)	1.96 (1.95)	5.12 (6.86)	.57 (.76)
BSHC G/KW HR (G/HP HR)	170.99 (127.51)	24.84 (18.52)	7.05 (5.26)	30.20 (22.52)
BSCO G/KW HR (G/HP HR)	975.58 (727.99)	345.92 (257.95)	231.34 (172.51)	386.29 (288.06)
BSCO2 G/KW HR (G/HP HR)	3175.22 (2367.76)	1240.28 (924.88)	864.75 (644.84)	1492.07 (1075.35)
BSNOX G/KW HR (G/HP HR)	8.48 (6.33)	4.81 (3.58)	4.42 (3.30)	4.97 (3.71)
BSFC KG/KW HR (LB/HP HR)	1.655 (2.721)	.587 (.965)	.394 (.648)	.676 (1.112)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		7.39 (9.91)
BSHC	G/KW HR (G/HP HR)	17.76 (13.25)
BSCO	G/KW HR (G/HP HR)	290.96 (216.60)
BSCO2	G/KW HR (G/HP HR)	1060 (790)
BSNOX	G/KW HR (G/HP HR)	4.68 (3.49)
BSFC	KG/KW HR (LB/HP HR)	.996 (.815)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-10B (CONT'D). TEST 5-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL 69 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 5-4 RUN
DATE 12/20/78
TIME 08:49
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.58 MM HG(28.96 IN HG)
DRY BULB TEMP. 30.6 DEG C(87.0 DEG F)

RELATIVE HUMIDITY 39 PCT
ABSOLUTE HUMIDITY 11.2 GM/KG(78.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0151

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	668.0 (26.3)	683.3 (26.9)	726.9 (28.6)	685.8 (27.0)
BLOWER INLET P MM. H2O(IN. H2O)	444.5 (17.5)	457.2 (18.0)	508.0 (20.0)	459.7 (18.1)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8085	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.9 (6388)	203.8 (7200)	208.9 (7382)	180.5 (6376)
HC SAMPLE METER/RANGE/PPM	19.5/ 3/ 195	20.1/ 3/ 201	31.1/ 3/ 311	16.3/ 3/ 163
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15	1.9/ 3/ 19	1.6/ 3/ 16	1.6/ 3/ 16
CO SAMPLE METER/RANGE/PPM	32.5/ 3/ 960	55.7/ 3/ 1640	76.2/ 2/ 9999	37.0/ 3/ 1091
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.7/ 3/ 21	.3/ 2/ 18	.7/ 3/ 21
CO2 SAMPLE METER/RANGE/PCT	18.9/ 3/ .30	30.2/ 3/ .50	67.2/ 3/ 1.20	18.6/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .09	2.5/ 3/ .09	2.3/ 3/ .09	2.6/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	9.7/ 2/ 10	21.1/ 2/ 21	60.0/ 2/ 60	9.2/ 2/ 9
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.2/ 2/ 0	.3/ 2/ 0	.7/ 2/ 1
DILUTION FACTOR	32.72	19.68	7.86	31.70
HC CONCENTRATION PPM	180	188	297	148
CO CONCENTRATION PPM	921	1583	9757	1050
CO2 CONCENTRATION PCT	.26	.46	1.17	.26
NOX CONCENTRATION PPM	9.3	20.9	59.7	8.5
HC MASS GRAMS	18.82	22.07	35.71	15.36
CO MASS GRAMS	194.06	375.85	1159.62	220.79
CO2 MASS GRAMS	862.9	1733.1	9451.5	862.1
NOX MASS GRAMS	3.27	8.28	29.18	2.99
FUEL KG (LB)	.387 (.85)	.755 (1.66)	2.011 (9.43)	.397 (.87)
HP HR (HP HR)	.56 (.75)	1.98 (1.98)	5.15 (6.90)	.60 (.81)
BSHC G/KW HR (G/HP HR)	33.96 (24.95)	19.95 (11.15)	6.99 (5.17)	25.42 (18.96)
BSCO G/KW HR (G/HP HR)	349.92 (257.21)	254.69 (189.92)	224.35 (167.30)	365.98 (272.59)
BSCO2 G/KW HR (G/HP HR)	1532.79 (1143.00)	1179.41 (875.75)	869.99 (649.99)	1427.11 (1069.19)
BSNOX G/KW HR (G/HP HR)	5.81 (9.33)	5.61 (9.18)	9.20 (3.50)	9.99 (3.69)
BSFC KG/KW HR (LB/HP HR)	.688 (1.130)	.511 (.841)	.391 (.642)	.656 (1.079)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.79 (10.45)
BSHC G/KW HR (G/HP HR)	11.81 (8.80)
BSCO G/KW HR (G/HP HR)	249.75 (186.24)
BSCO2 G/KW HR (G/HP HR)	1015 (757)
BSNOX G/KW HR (G/HP HR)	4.47 (3.71)
BSFC KG/KW HR (LB/HP HR)	.456 (.749)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-11A. TEST 9-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL -0 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 9-1 RUN
DATE 3/15/79
TIME 10:01
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 747.78 MM HG(29.44 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 16 PCT
ABSOLUTE HUMIDITY 3.2 GM/KG(22.4 GRAINS/LB)

NOX HUMIDITY C.F. .8018

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8089	8320	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.9 (6495)	207.1 (7316)	211.4 (7467)	183.6 (6485)
HC SAMPLE METER/RANGE/PPM	36.7/ 3/ 367	20.6/ 3/ 206	22.8/ 3/ 228	12.4/ 3/ 124
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	1.4/ 3/ 14	1.1/ 3/ 11	1.2/ 3/ 12
CO SAMPLE METER/RANGE/PPM	35.5/ 3/ 1047	46.8/ 3/ 1378	47.0/ 2/ 3029	28.4/ 3/ 840
CO BCKGRD METER/RANGE/PPM	.4/ 3/ 12	1.1/ 3/ 34	.3/ 2/ 18	.6/ 3/ 18
CO2 SAMPLE METER/RANGE/PCT	17.4/ 3/ .28	28.7/ 3/ .47	62.0/ 3/ 1.09	16.5/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.0/ 3/ .05	3.1/ 3/ .05	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.4/ 2/ 9	28.4/ 2/ 28	86.3/ 2/ 86	10.7/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	0.0/ 3/ 0	0.0/ 2/ 0	0.0/ 2/ 0	.4/ 2/ 0
DILUTION FACTOR	31.95	21.25	9.49	37.28
HC CONCENTRATION PPM	359	193	218	112
CO CONCENTRATION PPM	1029	1327	2934	814
CO2 CONCENTRATION PCT	.23	.43	1.05	.23
NOX CONCENTRATION PPM	9.4	28.4	86.3	10.3
HC MASS GRAMS	37.59	23.02	26.60	11.90
CO MASS GRAMS	219.37	320.03	722.90	173.99
CO2 MASS GRAMS	774.7	1631.9	4069.9	757.4
NOX MASS GRAMS	2.65	9.02	27.98	2.90
FUEL KG (LB)	.342 (.86)	.696 (1.53)	1.667 (3.68)	.337 (.74)
KW HR (HP HR)	.59 (.79)	1.46 (1.96)	5.02 (6.73)	.58 (.77)
BSHC G/KW HR (G/HP HR)	63.67 (47.48)	15.74 (11.74)	5.30 (3.95)	20.62 (15.38)
BSCO G/KW HR (G/HP HR)	371.58 (277.09)	218.85 (163.20)	143.95 (107.35)	301.66 (224.95)
BSCO2 G/KW HR (G/HP HR)	1320.71 (984.85)	1115.96 (832.17)	811.01 (604.77)	1313.13 (979.20)
BSNOX G/KW HR (G/HP HR)	4.49 (3.35)	6.17 (4.60)	5.58 (4.16)	5.03 (3.75)
BSFC KG/KW HR (LB/HP HR)	.664 (1.092)	.476 (.782)	.332 (.546)	.584 (.960)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) 0.000 (0.00)
MULTIPLIER FOR G/TEST 0.000
MULTIPLIER FOR G/KW HR (G/HP HR) 0.0000 (0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) 0.0000 (0.0000)

20 X 20 FILTERS
SAMPLE FLOW SCM(SCF) 0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		2.65 (10.26)
BSHC	G/KW HR (G/HP HR)	12.96 (9.66)
BSCO	G/KW HR (G/HP HR)	187.74 (140.00)
BSCO2	G/KW HR (G/HP HR)	947 (706)
BSNOX	G/KW HR (G/HP HR)	5.57 (4.15)
BSFC	KG/KW HR (LB/HP HR)	.404 (.665)

TABLE B-11A (CONT'D). TEST 9-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL -0 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 4

TEST NO. 9-1 RUN
DATE 3/15/79
TIME 10:41 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 747.78 MM HG(29.44 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 16 PCT
ABSOLUTE HUMIDITY 3.3 GM/KG(23.3 GRAINS/LB) — NOX HUMIDITY C.F. .8045

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8318	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.8 (6491)	207.0 (7312)	211.4 (7465)	183.6 (6484)
HC SAMPLE METER/RANGE/PPM	26.1/ 3/ 261	16.9/ 3/ 169	22.3/ 3/ 223	13.4/ 3/ 134
HC BCKGRD METER/RANGE/PPM	1.0/ 3/ 10	1.1/ 3/ 11	1.2/ 3/ 12	1.2/ 3/ 12
CO SAMPLE METER/RANGE/PPM	29.7/ 3/ 878	44.5/ 3/ 1311	94.9/ 3/ 2759	28.8/ 3/ 852
CO BCKGRD METER/RANGE/PPM	1.0/ 3/ 31	1.2/ 3/ 37	1.3/ 3/ 40	1.5/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	16.5/ 3/ .26	27.5/ 3/ .45	61.9/ 3/ 1.09	16.1/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.5/ 3/ .04	3.3/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	12.2/ 2/ 12	25.6/ 2/ 26	89.6/ 2/ 90	11.1/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.4/ 2/ 0	.5/ 2/ 1
DILUTION FACTOR	35.55	22.37	9.69	37.76
HC CONCENTRATION PPM	251	158	212	122
CO CONCENTRATION PPM	839	1258	2651	799
CO2 CONCENTRATION PCT	.22	.42	1.05	.21
NOX CONCENTRATION PPM	11.9	25.3	84.2	10.6
HC MASS GRAMS	26.64	18.92	25.87	12.95
CO MASS GRAMS	179.62	303.17	652.45	170.74
CO2 MASS GRAMS	748.1	1578.6	4050.1	719.5
NOX MASS GRAMS	3.37	8.06	29.03	3.00
FUEL KG (LB)	.351 (.77)	.667 (1.47)	1.626 (3.58)	.324 (.72)
KW HR (HP HR)	.59 (.79)	1.46 (1.96)	5.02 (6.74)	.58 (.78)
BSHC G/KW HR (G/HP HR)	45.12 (33.64)	12.94 (9.65)	5.15 (3.84)	22.28 (16.61)
BSCO G/KW HR (G/HP HR)	304.24 (226.87)	207.32 (154.60)	129.90 (96.86)	293.72 (219.02)
BSCO2 G/KW HR (G/HP HR)	1267.19 (944.94)	1079.49 (804.97)	806.35 (601.30)	1237.78 (923.01)
BSNOX G/KW HR (G/HP HR)	5.70 (4.25)	5.51 (4.11)	5.78 (4.31)	5.16 (3.85)
BSFC KG/KW HR (LB/HP HR)	.595 (.979)	.456 (.750)	.324 (.532)	.558 (.917)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.66 (10.27)
BSHC G/KW HR (G/HP HR)	11.02 (8.22)
BSCO G/KW HR (G/HP HR)	170.56 (127.19)
BSCO2 G/KW HR (G/HP HR)	927 (691)
BSNOX G/KW HR (G/HP HR)	5.68 (4.23)
BSFC KG/KW HR (LB/HP HR)	.388 (.637)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-11B. TEST 9-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL -0 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 9-3 RUN
DATE 3/19/79
TIME 09:11
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.12 MM HG(29.06 IN HG)
DRY BULB TEMP. 28.9 DEG C(84.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 13.6 GM/KG(95.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.1068

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8319	7164
TIME SECONDS	271.9	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.3 (6403)	204.2 (7212)	208.5 (7364)	181.1 (6396)
HC SAMPLE METER/RANGE/PPM	46.2/ 3/ 462	24.5/ 3/ 245	36.5/ 3/ 365	14.6/ 3/ 146
HC BCKGRD METER/RANGE/PPM	4.0/ 3/ 40	3.1/ 3/ 31	2.7/ 3/ 27	2.5/ 3/ 25
CO SAMPLE METER/RANGE/PPM	33.7/ 3/ 995	47.6/ 3/ 1402	52.8/ 2/ 3914	30.7/ 3/ 907
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	.6/ 3/ 18	1.8/ 3/ 55	1.0/ 3/ 31
CO2 SAMPLE METER/RANGE/PCT	18.6/ 3/ .30	29.6/ 3/ .49	63.0/ 3/ 1.11	15.6/ 3/ .25
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .09	2.7/ 3/ .09	2.6/ 3/ .08	2.3/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	8.7/ 2/ 9	25.0/ 2/ 25	64.3/ 2/ 64	7.6/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 0	.1/ 2/ 0	1.2/ 2/ 1	1.3/ 2/ 1
DILUTION FACTOR	30.27	20.59	9.07	38.05
HC CONCENTRATION PPM	423	216	341	122
CO CONCENTRATION PPM	959	1347	3234	858
CO2 CONCENTRATION PCT	.26	.45	1.08	.21
NOX CONCENTRATION PPM	8.3	24.9	63.2	6.3
HC MASS GRAMS	44.26	25.38	41.00	12.71
CO MASS GRAMS	201.47	320.38	785.16	180.91
CO2 MASS GRAMS	856.1	1685.1	4115.7	711.9
NOX MASS GRAMS	3.19	10.77	27.91	2.43
FUEL KG (LB)	.419 (.91)	.715 (1.58)	1.727 (3.81)	.327 (.72)
KW HR (HP HR)	.64 (.86)	1.47 (1.97)	4.91 (6.58)	.57 (.77)
BSHC G/KW HR (G/HP HR)	69.12 (51.54)	17.25 (12.86)	8.35 (6.23)	22.21 (16.56)
BSCO G/KW HR (G/HP HR)	314.63 (234.62)	217.74 (162.37)	159.93 (119.26)	316.16 (235.76)
BSCO2 G/KW HR (G/HP HR)	1336.93 (996.95)	1145.22 (853.99)	838.36 (625.17)	1244.08 (927.71)
BSNOX G/KW HR (G/HP HR)	4.98 (3.72)	7.32 (5.46)	5.69 (4.24)	4.24 (3.16)
BSFC KG/KW HR (LB/HP HR)	.646 (1.063)	.486 (.799)	.352 (.578)	.571 (.939)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		7.59 (10.18)
BSHC	G/KW HR (G/HP HR)	16.24 (12.11)
BSCO	G/KW HR (G/HP HR)	195.95 (146.12)
BSCO2	G/KW HR (G/HP HR)	970 (724)
BSNOX	G/KW HR (G/HP HR)	5.83 (4.35)
BSFC	KG/KW HR (LB/HP HR)	.919 (.689)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-11B (CONT'D). TEST 9-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.CH366
ENGINE MODEL -0 CHEV 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 9-3 RUN
DATE 3/19/79
TIME 09:50
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.12 MM HG(29.06 IN HG)
DRY BULB TEMP. 31.1 DEG C(88.0 DEG F)

RELATIVE HUMIDITY 44 PCT
ABSOLUTE HUMIDITY 13.0 GM/KG(90.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0805

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	52.2 (126.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8084	8316	7162
TIME SECONDS	272.0	306.9	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.2 (6401)	205.5 (7257)	208.4 (7361)	181.0 (6394)
HC SAMPLE METER/RANGE/PPM	16.9/ 3/ 169	17.3/ 3/ 173	26.0/ 3/ 260	16.5/ 3/ 165
HC BCKGRD METER/RANGE/PPM	1.9/ 3/ 19	2.0/ 3/ 20	1.6/ 3/ 16	1.8/ 3/ 18
CO SAMPLE METER/RANGE/PPM	27.0/ 3/ 799	44.0/ 3/ 1296	51.9/ 2/ 3354	29.5/ 3/ 872
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.8/ 3/ 24	1.0/ 3/ 31	.9/ 3/ 28
CO2 SAMPLE METER/RANGE/PCT	18.0/ 3/ .29	29.1/ 3/ .48	63.5/ 3/ 1.12	16.4/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	3.0/ 3/ .05	3.4/ 3/ .05	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	10.6/ 2/ 11	23.1/ 2/ 23	70.3/ 2/ 70	8.0/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.5/ 2/ 1	.6/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	34.86	21.44	9.10	36.79
HC CONCENTRATION PPM	151	154	246	147
CO CONCENTRATION PPM	760	1242	3207	829
CO2 CONCENTRATION PCT	.25	.44	1.08	.22
NOX CONCENTRATION PPM	10.4	22.6	69.8	7.1
HC MASS GRAMS	15.74	18.24	29.54	15.40
CO MASS GRAMS	160.35	297.27	778.22	174.71
CO2 MASS GRAMS	831.5	1645.4	4109.8	736.2
NOX MASS GRAMS	3.90	4.61	30.05	2.67
FUEL KG (LB)	.357 (.79)	.684 (1.51)	1.711 (3.77)	.334 (.74)
KW HR (HP HR)	.61 (.82)	1.44 (1.93)	4.91 (6.58)	.58 (.77)
BSHC G/KW HR (G/HP HR)	25.86 (19.28)	12.67 (9.45)	6.02 (4.49)	26.70 (19.91)
BSCO G/KW HR (G/HP HR)	263.50 (196.49)	206.49 (153.98)	158.52 (118.21)	302.92 (225.89)
BSCO2 G/KW HR (G/HP HR)	1366.39 (1018.92)	1192.91 (852.27)	837.14 (624.26)	1276.52 (951.90)
BSNOX G/KW HR (G/HP HR)	6.40 (4.78)	6.67 (4.98)	6.12 (4.56)	4.62 (3.45)
BSFC KG/KW HR (LB/HP HR)	.587 (.965)	.475 (.781)	.348 (.573)	.579 (.952)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.53	(10.10)
BSHC G/KW HR (G/HP HR)	10.47	(7.81)
BSCO G/KW HR (G/HP HR)	187.22	(139.61)
BSCO2 G/KW HR (G/HP HR)	972	(725)
BSNOX G/KW HR (G/HP HR)	6.14	(4.57)
BSFC KG/KW HR (LB/HP HR)	.410	(.673)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE B-12A. TEST 13-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.F 360
ENGINE MODEL -0 FORD 360
ENGINE 5.9 L(360 CID) V-8
CVS NO. 9

TEST NO. 13-2 RUN
DATE 6/26/79
TIME 09:06
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 749.73 MM HG(29.32 IN HG)
DRY BULB TEMP. 27.8 DEG C(82.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 12.5 GM/KG(87.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0639

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8083	8313	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.9 (6461)	206.1 (7279)	210.3 (7428)	182.7 (6454)
HC SAMPLE METER/RANGE/PPM	32.7/ 3/ 327	20.2/ 3/ 202	24.3/ 3/ 243	12.7/ 3/ 127
HC BCKGRD METER/RANGE/PPM	2.5/ 3/ 25	2.4/ 3/ 24	2.5/ 3/ 25	2.3/ 3/ 23
CO SAMPLE METER/RANGE/PPM	40.3/ 3/ 962	45.4/ 3/ 1097	59.6/ 2/ 3022	34.4/ 3/ 811
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.2/ 2/ 8	.4/ 3/ 9
CO2 SAMPLE METER/RANGE/PCT	20.8/ 3/ .34	32.1/ 3/ .53	73.9/ 3/ 1.34	20.6/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.6/ 3/ .06	4.3/ 3/ .07	4.1/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	7.3/ 2/ 7	21.8/ 2/ 22	92.1/ 2/ 92	13.4/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	1.0/ 2/ 1	1.5/ 2/ 2	1.7/ 2/ 2
DILUTION FACTOR	29.01	20.30	8.08	31.62
HC CONCENTRATION PPM	303	179	221	105
CO CONCENTRATION PPM	938	1065	2886	783
CO2 CONCENTRATION PCT	.28	.48	1.29	.27
NOX CONCENTRATION PPM	6.4	20.8	90.8	11.8
HC MASS GRAMS	31.96	21.30	26.82	11.04
CO MASS GRAMS	199.72	255.65	706.76	166.71
CO2 MASS GRAMS	954.6	1814.4	4953.2	906.5
NOX MASS GRAMS	2.39	8.74	38.86	4.37
FUEL KG (LB)	.432 (.95)	.720 (1.59)	1.938 (4.27)	.379 (.84)
KW HR (HP HR)	.60 (.81)	1.60 (2.15)	5.35 (7.18)	.73 (.98)
BSHC G/KW HR (G/HP HR)	53.14 (39.63)	13.30 (9.92)	5.01 (3.74)	15.14 (11.29)
BSCO G/KW HR (G/HP HR)	332.12 (247.66)	159.66 (119.06)	132.05 (98.47)	228.63 (170.49)
BSCO2 G/KW HR (G/HP HR)	1587.44 (1183.75)	1133.19 (845.02)	925.45 (690.11)	1243.26 (927.10)
BSNOX G/KW HR (G/HP HR)	3.98 (2.97)	5.46 (4.07)	7.26 (5.41)	5.99 (4.47)
BSFC KG/KW HR (LB/HP HR)	.718 (1.181)	.450 (.739)	.362 (.595)	.520 (.855)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.28	(11.11)
BSHC G/KW HR (G/HP HR)	11.00	(8.20)
BSCO G/KW HR (G/HP HR)	160.41	(119.62)
BSCO2 G/KW HR (G/HP HR)	1042	(777)
BSNOX G/KW HR (G/HP HR)	6.56	(4.89)
BSFC KG/KW HR (LB/HP HR)	.419	(.689)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE B-12A (CONT'D). TEST 13-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.F 360
ENGINE MODEL -0 FORD 360
ENGINE 5.9 L(360 CID) V-8
CVS NO. 9

TEST NO. 13-2 RUN
DATE 6/26/79
TIME 09:46
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 749.73 MM HG(29.32 IN HG)
DRY BULB TEMP. 28.3 DEG C(83.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 13.3 GM/KG(93.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.0944

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.9 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7161	8081	8313	7161
TIME SECONDS	272.0	305.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.9 (6460)	206.0 (7277)	210.3 (7428)	182.7 (6454)
HC SAMPLE METER/RANGE/PPM	13.8/ 3/ 138	14.3/ 3/ 143	22.4/ 3/ 224	12.2/ 3/ 122
HC BCKGRD METER/RANGE/PPM	2.5/ 3/ 25	2.2/ 3/ 22	2.2/ 3/ 22	2.6/ 3/ 26
CO SAMPLE METER/RANGE/PPM	24.7/ 3/ 572	29.6/ 3/ 691	92.5/ 3/ 2631	30.7/ 3/ 719
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 5	.4/ 3/ 9	.3/ 3/ 7	.5/ 3/ 11
CO2 SAMPLE METER/RANGE/PCT	19.7/ 3/ .32	32.4/ 3/ .54	71.9/ 3/ 1.30	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	4.2/ 3/ .06	3.8/ 3/ .06	3.8/ 3/ .06	4.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	11.9/ 2/ 12	27.3/ 2/ 27	96.6/ 2/ 97	12.4/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	1.4/ 2/ 1	1.4/ 2/ 1	1.6/ 2/ 2	1.8/ 2/ 2
DILUTION FACTOR	34.70	21.61	8.50	34.17
HC CONCENTRATION PPM	114	122	205	97
CO CONCENTRATION PPM	554	664	2513	691
CO2 CONCENTRATION PCT	.25	.48	1.25	.25
NOX CONCENTRATION PPM	10.5	26.0	95.2	10.7
HC MASS GRAMS	12.00	14.50	24.82	10.20
CO MASS GRAMS	118.04	159.23	615.42	147.01
CO2 MASS GRAMS	850.9	1822.7	4820.4	827.0
NOX MASS GRAMS	4.04	11.20	41.91	4.08
FUEL KG (LB)	.339 (.75)	.668 (1.47)	1.849 (4.08)	.344 (.76)
KW HR (HP HR)	.74 (.99)	1.62 (2.18)	5.34 (7.17)	.74 (1.00)
BSHC G/KW HR (G/HP HR)	16.28 (12.14)	8.93 (6.66)	4.64 (3.46)	13.70 (10.22)
BSCO G/KW HR (G/HP HR)	160.23 (119.49)	98.07 (73.13)	115.15 (85.86)	197.54 (147.30)
BSCO2 G/KW HR (G/HP HR)	1154.34 (860.79)	1122.56 (837.09)	901.90 (672.55)	1111.30 (828.70)
BSNOX G/KW HR (G/HP HR)	5.48 (4.09)	6.90 (5.14)	7.84 (5.85)	5.48 (4.08)
BSFC KG/KW HR (LB/HP HR)	.460 (.755)	.411 (.676)	.346 (.569)	.462 (.759)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.45	(11.33)
BSHC G/KW HR (G/HP HR)	7.28	(5.43)
BSCO G/KW HR (G/HP HR)	123.05	(91.76)
BSCO2 G/KW HR (G/HP HR)	985	(734)
BSNOX G/KW HR (G/HP HR)	7.25	(5.40)
BSFC KG/KW HR (LB/HP HR)	.379	(.623)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-12B. TEST 13-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE 460.F 360
ENGINE MODEL -8 FORD 360
ENGINE 5.9 L(360 CID) V-8
CVS NO. 9

TEST NO. 13-3 RUN
DATE 6/27/79
TIME 08151
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(78.0 GRAINS/LB) NOX HUMIDITY C.F. 1.0141

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8084	8313	7160
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.1 (6466)	206.2 (7285)	210.5 (7434)	182.8 (6457)
HC SAMPLE METER/RANGE/PPM	42.5/ 3/ 425	22.1/ 3/ 221	25.3/ 3/ 253	13.9/ 3/ 139
HC BCKGRD METER/RANGE/PPM	2.2/ 3/ 22	2.2/ 3/ 22	2.3/ 3/ 23	2.1/ 3/ 21
CO SAMPLE METER/RANGE/PPM	42.7/ 3/ 1025	48.8/ 3/ 1190	61.0/ 2/ 3119	34.2/ 3/ 806
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.2/ 3/ 5	.1/ 2/ 4	.4/ 3/ 9
CO2 SAMPLE METER/RANGE/PCT	20.0/ 3/ .32	32.0/ 3/ .53	72.5/ 3/ 1.32	19.6/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.7/ 3/ .06	4.1/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	8.0/ 2/ 8	23.2/ 2/ 23	94.9/ 2/ 95	13.2/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.1/ 2/ 1	1.3/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	28.86	20.02	8.17	32.89
HC CONCENTRATION PPM	409	200	233	119
CO CONCENTRATION PPM	999	1153	2983	779
CO2 CONCENTRATION PCT	.27	.48	1.26	.26
NOX CONCENTRATION PPM	6.9	22.2	93.8	12.1
HC MASS GRAMS	42.63	23.80	28.26	12.51
CO MASS GRAMS	212.99	276.91	731.20	165.75
CO2 MASS GRAMS	904.7	1803.7	4856.4	859.9
NOX MASS GRAMS	2.46	8.86	38.28	4.30
FUEL KG (LB)	.433 (.96)	.730 (1.61)	1.921 (4.24)	.366 (.81)
KW HR (HP HR)	.67 (.90)	1.63 (2.19)	5.37 (7.21)	.75 (1.01)
BSHC G/KW HR (G/HP HR)	63.72 (47.52)	14.59 (10.88)	5.26 (3.92)	16.64 (12.41)
BSCO G/KW HR (G/HP HR)	318.36 (237.40)	169.76 (126.59)	136.04 (101.45)	220.49 (164.42)
BSCO2 G/KW HR (G/HP HR)	1352.29 (1008.40)	1105.76 (824.56)	903.56 (673.79)	1143.91 (853.01)
BSNOX G/KW HR (G/HP HR)	3.68 (2.75)	5.43 (4.05)	7.12 (5.31)	5.72 (4.27)
BSFC KG/KW HR (LB/HP HR)	.648 (1.065)	.447 (.735)	.357 (.588)	.486 (.800)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.43	(11.30)
BSHC G/KW HR (G/HP HR)	12.72	(9.49)
BSCO G/KW HR (G/HP HR)	164.58	(122.73)
BSCO2 G/KW HR (G/HP HR)	1000	(746)
BSNOX G/KW HR (G/HP HR)	5.40	(4.03)
BSFC KG/KW HR (LB/HP HR)	.499	(.823)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00	(0.0)

TABLE B-12B (CONT'D). TEST 13-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.F 360
ENGINE MODEL -0 FORD 360
ENGINE 5.9 L(360 CID) V-8
CVS NO. 9

TEST NO. 13-3 RUN
DATE 6/27/79
TIME 09:31
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 745.24 MM HG(29.34 IN HG)
DRY BULB TEMP. 28.3 DEG C(83.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 12.5 GM/KG(87.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0633

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7161	8082	8312	7160
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.0 (6464)	206.2 (7283)	210.4 (7433)	182.8 (6457)
HC SAMPLE METER/RANGE/PPM	14.8/ 3/ 148	15.3/ 3/ 153	24.0/ 3/ 240	13.0/ 3/ 130
HC BCKGRD METER/RANGE/PPM	2.3/ 3/ 23	2.1/ 3/ 21	2.1/ 3/ 21	2.4/ 3/ 24
CO SAMPLE METER/RANGE/PPM	25.1/ 3/ 582	29.7/ 3/ 694	95.5/ 3/ 2752	31.7/ 3/ 743
CO BCKGRD METER/RANGE/PPM	.4/ 3/ 9	.4/ 3/ 9	.5/ 3/ 11	.8/ 3/ 18
CO2 SAMPLE METER/RANGE/PCT	19.0/ 3/ .30	32.2/ 3/ .54	70.9/ 3/ 1.28	19.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.7/ 3/ .06	3.7/ 3/ .06	3.8/ 3/ .06	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	11.6/ 2/ 12	27.4/ 2/ 27	95.1/ 2/ 95	12.3/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	1.0/ 2/ 1	1.1/ 2/ 1	1.5/ 2/ 2
DILUTION FACTOR	35.60	21.69	8.53	34.18
HC CONCENTRATION PPM	126	133	221	107
CO CONCENTRATION PPM	560	667	2629	709
CO2 CONCENTRATION PCT	.25	.48	1.23	.25
NOX CONCENTRATION PPM	10.7	26.4	99.1	10.8
HC MASS GRAMS	13.26	15.81	26.88	11.25
CO MASS GRAMS	119.37	160.11	699.37	151.04
CO2 MASS GRAMS	836.4	1816.0	4744.5	831.3
NOX MASS GRAMS	3.99	11.09	40.29	4.03
FUEL KG (LB)	.336 (.74)	.668 (1.47)	1.842 (4.06)	.348 (.77)
KW HR (HP HR)	.73 (.98)	1.62 (2.18)	5.36 (7.19)	.74 (.99)
HSHC G/KW HR (G/HP HR)	18.19 (13.56)	9.74 (7.26)	5.02 (3.74)	15.27 (11.39)
HSCO G/KW HR (G/HP HR)	163.70 (122.07)	98.61 (73.53)	120.22 (89.65)	205.03 (152.89)
HSCO2 G/KW HR (G/HP HR)	1147.10 (855.39)	1118.96 (834.03)	885.21 (660.10)	1128.99 (841.51)
HSNOX G/KW HR (G/HP HR)	5.48 (4.08)	6.83 (5.09)	7.52 (5.61)	5.47 (4.08)
HSFC KG/KW HR (LB/HP HR)	.461 (.758)	.411 (.676)	.344 (.565)	.473 (.777)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.45	(11.33)
HSHC G/KW HR (G/HP HR)	7.95	(5.93)
HSCO G/KW HR (G/HP HR)	127.22	(94.87)
HSCO2 G/KW HR (G/HP HR)	974	(726)
HSNOX G/KW HR (G/HP HR)	7.03	(5.24)
HSFC KG/KW HR (LB/HP HR)	.378	(.621)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE B-13A. ENGINE 2 NINE-MODE EMISSIONS RESULTS

1969 IH304 --- PROJECT 11-5044-001

BAR= 29.10

10 11 78 TEST 21 DUR HRS IH304 K= 1.076 HUM= 14.1 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	22480	9.220	6.56	0	18.272	2767	377	2820	0	.232	R	R	I	0.0
2 25 PCT T	2880	2.000	13.22	573	15.549	7711	163	2004	102	.077	7.646	93.952	4.761	15.9
3 55 PCT T	2560	.920	13.84	1849	15.052	10886	211	1344	478	.147	4.584	29.170	10.370	34.4
4 25 PCT T	2000	1.940	13.47	677	15.639	7303	107	1830	113	.077	5.194	88.991	5.493	15.3
5 10 PCT T	1800	2.570	13.10	250	15.876	5670	74	1854	32	.057	8.395	211.685	3.642	6.5
6 25 PCT T	1880	1.890	13.39	746	15.495	7257	101	1788	125	.077	4.985	88.600	6.186	15.1
7 90 PCT T	2080	3.080	12.90	1190	16.218	17146	252	6577	450	.113	3.425	89.495	6.116	54.8
8 25 PCT T	1980	2.000	13.42	768	15.635	7121	98	1840	125	.077	4.851	91.174	6.193	15.1
9 C.T.	137600	5.450	3.72	10	23.806	2858	1757	1322	0	.143	R	R	R	0.0
1 25 PCT T	2200	1.980	13.34	704	15.571	7212	116	1852	117	.077	5.559	88.447	5.563	15.6
2 55 PCT T	2000	1.060	13.66	1973	14.948	10569	161	1514	498	.147	3.498	32.855	10.817	34.4
3 25 PCT T	2000	2.050	13.34	684	15.619	7121	104	1888	111	.077	5.069	91.818	5.419	15.3
4 10 PCT T	2000	2.770	12.97	211	15.969	5488	79	1923	26	.057	8.976	219.573	2.959	6.5
5 25 PCT T	1920	2.030	13.34	677	15.589	7212	102	1897	112	.077	4.760	88.958	5.248	15.9
6 90 PCT T	2080	3.180	12.80	1081	16.218	17191	252	6809	409	.113	3.381	91.227	5.486	55.7
7 25 PCT T	1920	2.120	13.34	677	15.680	7076	99	1933	109	.077	4.730	92.273	5.212	15.6
8 C.T.	143360	5.360	3.71	12	24.312	2812	1763	1252	0	.143	R	R	R	0.0
9 IDLE	21000	9.960	7.09	7	19.385	2676	324	2777	0	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	6.1	R	I	.093	R	600	10.7	20.0	26.6	0.0	8.9	0.0
2 25 PCT T		21.3	56	17.0	.797	4.8	.071	.485	2000	14.1	2.9	6.3	4.9	8.3	7.5
3 55 PCT T		46.1	121	24.0	.521	10.4	.068	.317	2000	14.7	7.1	8.0	44.3	22.3	30.9
4 25 PCT T		20.6	54	16.1	.783	5.5	.071	.476	2000	14.0	1.9	5.7	5.5	7.8	7.2
5 10 PCT T		8.8	23	12.5	1.427	3.6	.073	.868	2000	13.8	1.0	4.3	1.1	4.5	2.3
6 25 PCT T		20.2	53	16.0	.793	6.2	.071	.482	2000	14.2	1.8	5.6	6.1	7.8	7.1
7 90 PCT T		73.5	143	37.8	.514	6.1	.075	.313	2000	13.4	6.5	30.2	32.0	27.0	37.9
8 25 PCT T		20.2	53	15.7	.778	6.2	.071	.473	2000	14.0	1.7	5.7	6.1	7.6	7.1
9 C.T.		0.0	0	6.3	R	R	.137	R	2000	7.3	57.3	7.7	.0	5.7	0.0
1 25 PCT T		20.9	55	15.9	.759	5.6	.071	.462	2000	14.1	2.2	5.7	5.8	7.9	7.3
2 55 PCT T		46.1	121	23.3	.506	10.8	.068	.308	2000	14.7	5.7	8.9	47.0	22.1	30.6
3 25 PCT T		20.6	54	15.7	.763	5.9	.071	.464	2000	14.0	1.9	5.8	5.5	7.8	7.1
4 10 PCT T		8.8	23	12.1	1.381	3.8	.073	.840	2000	13.6	1.1	4.4	.9	4.4	2.3
5 25 PCT T		21.3	56	15.9	.746	5.2	.071	.454	2000	14.1	1.9	5.8	5.5	7.9	7.4
6 90 PCT T		74.6	146	37.9	.508	5.5	.075	.309	2000	13.4	6.8	30.7	29.7	27.6	38.1
7 25 PCT T		20.9	55	15.6	.745	5.2	.072	.453	2000	14.0	1.8	5.9	5.4	7.7	7.3
8 C.T.		0.0	0	6.2	R	R	.141	R	2000	7.1	60.6	7.1	.0	5.7	0.0
9 IDLE		0.0	0	5.9	R	R	.099	R	690	10.1	18.0	25.7	.1	8.8	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 26.8 151 9.7

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 25.2 152 9.4

140 CYCLE COMPOSITE -

HC- FID 0.35(26.8) + 0.65(25.2) = 25.774 G/KW HR (19.219 BS)

CO- NDIR 0.35(150.8) + 0.65(151.8) = 151.450 G/KW HR (112.936 BS)

NOX-CL 0.35(9.7) + 0.65(9.4) = 9.526 G/KW HR (7.103 BS)

HC + NOX = 35.299 G/KW HR (26.323 BS)

SFC = .430 KG/KW HR (.708 BS)

TABLE B-13B. ENGINE 2 NINE-MODE EMISSIONS RESULTS

1969 IH304 --- PROJECT 11-5044-001 BAR=29.00

10 11 78 0330 PM TEST 23 DUR HRS K= 1.083 HUM= 14.4 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	19920	9.180	6.64	0	17.950	2722	335	2787	0	.232	R	R	I	0.0
2 25 PCT T	2360	2.070	13.02	568	15.359	7711	135	2049	103	.077	6.336	98.441	4.808	15.9
3 55 PCT T	2000	.890	13.59	1871	14.708	10750	166	1314	492	.147	3.642	28.756	10.760	34.1
4 25 PCT T	2000	1.890	13.22	711	15.338	7212	107	1795	120	.077	5.219	87.297	5.845	15.3
5 10 PCT T	1800	2.570	12.85	236	15.626	5625	74	1869	31	.057	8.830	223.054	3.646	6.2
6 25 PCT T	1800	1.860	13.22	684	15.285	7167	96	1762	115	.077	4.771	87.283	5.713	15.1
7 90 PCT T	2000	3.070	12.68	1105	15.979	17191	246	6672	427	.113	3.312	89.850	5.756	55.4
8 25 PCT T	1800	2.030	13.22	689	15.456	6940	92	1841	111	.077	4.489	89.541	5.409	15.3
9 C.T.	133760	5.260	3.56	10	23.017	2767	1707	1277	0	.143	R	R	R	0.0
1 25 PCT T	2120	2.020	13.10	702	15.362	7348	116	1952	121	.077	5.330	89.921	5.562	16.2
2 55 PCT T	1880	.870	13.47	2020	14.554	10659	157	1287	532	.147	3.399	27.934	11.544	34.4
3 25 PCT T	1720	2.000	13.10	679	15.296	7167	92	1893	114	.077	4.470	92.050	5.562	15.3
4 10 PCT T	1920	2.760	12.73	211	15.709	5488	77	1948	27	.057	8.744	222.395	3.026	6.5
5 25 PCT T	1800	1.920	13.22	709	15.345	7212	97	1823	120	.077	4.695	88.641	5.826	15.3
6 90 PCT T	2000	3.120	12.68	1100	16.029	17242	247	6795	426	.113	3.320	91.508	5.742	55.4
7 25 PCT T	1800	2.030	13.22	726	15.456	7212	96	1913	122	.077	4.580	91.360	5.816	15.6
8 C.T.	151360	5.200	3.44	12	24.680	2812	1828	1197	0	.143	R	R	R	0.0
9 IDLE	20720	9.750	6.90	10	18.959	2676	326	2780	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	6.0	R	I	.091	R	600	11.0	18.9	26.3	0.0	8.9	0.0
2 25 PCT T		21.3	56	17.0	.797	9.8	.070	.485	2000	14.2	2.5	6.6	5.0	8.4	7.5
3 55 PCT T		45.7	120	23.7	.519	10.8	.067	.315	2000	15.0	5.9	7.9	46.0	22.2	30.6
4 25 PCT T		20.6	54	15.9	.773	5.8	.070	.470	2000	14.3	2.0	5.6	5.9	7.8	7.2
5 10 PCT T		8.4	22	12.4	1.480	3.6	.072	.900	2000	14.0	1.0	4.3	1.1	4.5	2.2
6 25 PCT T		20.2	53	15.8	.783	5.7	.070	.476	2000	14.3	1.8	5.5	5.7	7.8	7.1
7 90 PCT T		74.3	195	37.9	.510	5.8	.074	.310	2000	13.6	6.8	30.6	30.8	27.3	38.2
8 25 PCT T		20.6	54	15.3	.744	5.4	.071	.453	2000	14.2	1.7	5.8	5.5	7.5	7.2
9 C.T.		0.0	0	6.1	R	R	.132	R	2000	7.6	59.3	7.4	.0	5.6	0.0
1 25 PCT T		21.7	57	16.2	.746	5.6	.070	.454	2000	14.2	2.1	6.1	5.6	8.0	7.6
2 55 PCT T		46.1	121	23.5	.510	11.5	.066	.310	2000	15.1	5.4	7.7	47.5	22.1	30.6
3 25 PCT T		20.6	54	15.8	.768	5.6	.070	.467	2000	14.3	1.7	5.9	5.3	7.8	7.2
4 10 PCT T		8.8	23	12.1	1.381	3.0	.072	.840	2000	13.9	1.0	4.5	.9	4.4	2.3
5 25 PCT T		20.6	54	15.9	.773	5.8	.070	.470	2000	14.3	1.8	5.7	5.6	7.8	7.2
6 90 PCT T		74.3	195	38.1	.513	5.7	.074	.312	2000	13.6	6.6	31.1	29.2	27.6	37.9
7 25 PCT T		20.9	55	15.9	.759	5.8	.071	.462	2000	14.2	1.7	6.0	5.7	7.8	7.3
8 C.T.		0.0	0	6.2	R	R	.145	R	2000	6.9	61.8	6.9	.0	5.7	0.0
9 IDLE		0.0	0	5.9	R	R	.097	R	690	10.3	17.9	26.1	.1	8.8	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 25.1 150 9.6

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 25.7 150 10.0

TWO CYCLE COMPOSITE -

HC- FID	0.35(25.1) + 0.65(25.7) =	25.472	G/KW HR	(18.995 GS)
CO- NDIR	0.35(150.3) + 0.65(149.7) =	149.885	G/KW HR	(111.769 GS)
NOX-CL	0.35(9.6) + 0.65(10.0) =	9.852	G/KW HR	(7.347 GS)
	HC + NOX =	35.324	G/KW HR	(26.341 GS)
	SFC =	.431	KG/KW HR	(.709 GS)

TABLE B-14A. ENGINE 3 NINE-MODE EMISSIONS RESULTS

1969 IH345 --- PROJECT 11-5044-001 BAR=29.33

10 30 78 1210 PM TEST 31 K= .866 HUM= 6.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	10200	3.830	8.73	10	13.691	1724	142	974	0	.232	R	R	R	0.0
2 25 PCT T	2300	1.680	13.42	1204	15.363	9525	163	2104	215	.077	6.785	87.708	8.949	17.9
3 55 PCT T	2100	1.350	13.64	2213	15.230	13608	214	2437	569	.147	4.018	45.703	10.666	39.8
4 25 PCT T	2050	1.600	13.47	1323	15.304	8936	137	1887	222	.077	5.520	76.239	8.975	18.5
5 10 PCT T	2000	1.130	13.55	578	14.908	6804	104	1042	76	.057	9.754	97.703	7.115	8.0
6 25 PCT T	1940	1.570	13.47	1302	15.261	8890	129	1847	218	.077	5.376	77.007	9.092	17.9
7 90 PCT T	1600	1.710	13.59	2064	15.483	19641	232	4382	753	.113	2.684	50.689	8.710	64.5
8 25 PCT T	1930	1.570	13.47	1344	15.260	8800	127	1829	223	.077	5.054	72.762	8.868	18.7
9 C.T.	38400	3.090	7.90	15	15.203	1724	478	708	0	.143	R	R	R	0.0
1 25 PCT T	2150	1.520	13.47	1279	15.235	8845	142	1783	214	.077	5.936	74.302	8.901	17.9
2 55 PCT T	2030	1.270	13.66	2311	15.162	13290	203	2249	583	.147	3.809	42.180	10.927	39.8
3 25 PCT T	1850	1.560	13.47	1284	15.241	8845	123	1829	214	.077	4.950	73.882	8.657	18.5
4 10 PCT T	1900	1.100	13.59	535	14.907	6804	99	1014	70	.057	9.268	95.118	6.586	8.0
5 25 PCT T	1920	1.510	13.47	1258	15.199	8709	126	1748	207	.077	5.232	72.851	8.641	17.9
6 90 PCT T	1650	1.770	13.54	2070	15.499	19504	237	4500	749	.113	2.746	52.052	8.666	64.5
7 25 PCT T	1880	1.600	13.47	1316	15.285	8754	123	1851	217	.077	4.890	73.653	8.624	18.7
8 C.T.	28800	2.850	8.67	18	14.698	1724	373	675	1	.143	R	R	R	0.0
9 IDLE	8900	4.340	9.77	12	15.108	1588	105	921	0	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	3.8	R	R	.065	R	400	15.4	15.9	12.3	.0	5.0	0.0
2 25 PCT T		24.0	63	21.0	.875	8.9	.070	.532	2000	14.3	6.0	8.9	6.9	9.1	7.2
3 55 PCT T		53.3	140	30.0	.563	10.7	.069	.342	2000	14.5	15.2	19.6	34.7	24.9	30.4
4 25 PCT T		24.8	65	19.7	.796	9.0	.070	.484	2000	14.4	5.1	7.9	7.1	8.6	7.4
5 10 PCT T		10.7	28	15.0	1.407	7.1	.068	.856	2000	14.8	2.9	3.2	1.8	4.8	2.4
6 25 PCT T		24.0	63	19.6	.817	9.1	.069	.497	2000	14.4	4.8	7.8	7.0	8.5	7.2
7 90 PCT T		86.4	227	43.3	.501	8.7	.070	.305	2000	14.2	12.6	27.1	35.3	27.6	37.9
8 25 PCT T		25.1	66	19.4	.772	8.9	.069	.470	2000	14.4	4.7	7.7	7.1	8.4	7.5
9 C.T.		0.0	0	3.8	R	R	.074	R	2000	13.4	32.9	5.5	.0	3.1	0.0
1 25 PCT T		24.0	63	19.5	.813	8.9	.069	.494	2000	14.4	6.1	7.8	6.8	8.7	7.2
2 55 PCT T		53.3	140	29.3	.550	10.9	.069	.334	2000	14.5	16.6	18.8	35.7	24.8	30.4
3 25 PCT T		24.8	65	19.5	.788	8.7	.069	.479	2000	14.4	5.3	8.0	6.9	8.7	7.4
4 10 PCT T		10.7	28	15.0	1.407	6.6	.068	.856	2000	14.8	3.1	3.3	1.7	4.9	2.4
5 25 PCT T		24.0	63	19.2	.800	8.6	.069	.487	2000	14.5	5.4	7.6	6.6	8.5	7.2
6 90 PCT T		86.4	227	43.0	.497	8.7	.071	.303	2000	14.2	14.9	28.9	35.3	28.0	37.9
7 25 PCT T		25.1	66	19.3	.768	8.6	.070	.467	2000	14.4	5.3	8.1	7.0	8.6	7.5
8 C.T.		0.0	0	3.8	R	R	.071	R	460	14.1	29.7	5.5	.0	3.1	0.0
9 IDLE		0.0	0	3.5	R	R	.072	R	460	14.0	13.6	12.1	.0	4.7	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 10.8 95 12.5

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 9.3 92 12.5

TWO CYCLE COMPOSITE -

HC- FID	0.35(10.8) + 0.65(9.3) =	9.862	G/KW HR	(7.354	BS)
CO- NDIR	0.35(95.3) + 0.65(91.8) =	93.021	G/KW HR	(69.366	BS)
NOX-CL	0.35(12.5) + 0.65(12.5) =	12.515	G/KW HR	(9.332	BS)
	HC + NOX =	22.377	G/KW HR	(16.687	BS)
	SFC =	.413	KG/KW HR	(.679	BS)

TABLE B-14B. ENGINE 3 NINE-MODE EMISSIONS RESULTS

1969 IH345 --- PROJECT 11-5044-001 BAR=29.45

10 31 78 TEST 32 K= .933 HUM= 8.3 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	5112	1.110	11.79	50	13,474	3130	133	521	4	.232	R	R	R	0.0
2 25 PCT T	2004	1.460	13.33	1242	15,018	9299	141	1826	238	.077	5,805	74,922	9,773	18.2
3 55 PCT T	1924	1.210	13.57	2311	15,000	13517	198	2203	645	.147	3,711	41,315	12,100	39.8
4 25 PCT T	1740	1.440	13.44	1300	15,079	8845	116	1706	236	.077	4,705	68,934	9,543	18.5
5 10 PCT T	1480	.890	13.40	508	14,981	6804	90	845	74	.057	8,420	79,220	6,934	8.0
6 25 PCT T	1680	1.300	13.22	1253	14,711	8754	114	1563	231	.077	4,669	64,119	9,476	18.2
7 90 PCT T	1584	1.540	13.57	2113	15,291	19504	231	3968	835	.113	2,683	46,106	9,700	64.2
8 25 PCT T	1608	1.410	13.44	1242	15,033	8618	105	1633	221	.077	4,249	65,965	8,910	18.5
9 C.T.	19200	2.220	8.97	18	13,309	1678	267	565	1	.143	R	R	R	0.0
1 25 PCT T	1780	1.330	13.34	1183	14,873	8709	119	1573	215	.077	4,951	65,574	8,944	17.9
2 55 PCT T	1928	1.230	13.47	2351	14,908	13154	184	2142	643	.147	3,449	41,120	12,052	39.8
3 25 PCT T	1600	1.340	13.22	1209	14,742	8618	106	1582	219	.077	4,237	62,960	8,696	18.7
4 10 PCT T	1600	.930	13.22	503	14,332	6804	86	892	74	.057	7,813	80,759	6,698	8.2
5 25 PCT T	1720	1.410	13.44	1230	15,046	8573	112	1623	217	.077	4,661	67,643	9,048	17.9
6 90 PCT T	1600	1.470	13.57	1230	15,423	19278	229	4217	496	.113	2,646	48,778	5,509	64.5
7 25 PCT T	1588	1.430	13.47	1279	15,081	8528	102	1633	224	.077	4,140	65,987	9,036	18.5
8 C.T.	22400	2.150	8.87	15	13,489	1633	299	526	1	.143	R	R	R	0.0
9 IDLE	15840	2.850	9.80	12	14,416	1542	189	616	0	.232	R	R	R	0.0

MODE	ID	UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	6.9	R	R	.062	R	900	16.2	18.6	7.8	.3	8.8	0.0
2 25 PCT T		24.4	64	20.5	.841	9.8	.068	.512	2000	14.6	6.6	9.1	6.9	8.6	7.3
3 55 PCT T		53.3	140	29.8	.559	12.1	.068	.340	2000	14.7	17.5	21.0	35.7	24.0	30.5
4 25 PCT T		24.8	65	19.5	.788	9.5	.069	.479	2000	14.6	5.4	8.5	6.8	8.2	7.4
5 10 PCT T		10.7	28	15.0	1.407	6.9	.066	.856	2000	15.2	3.1	3.1	1.6	4.7	2.4
6 25 PCT T		24.4	64	19.3	.792	9.5	.067	.482	2000	14.9	5.3	7.8	6.7	8.1	7.3
7 90 PCT T		86.1	226	43.0	.500	9.7	.070	.304	2000	14.4	15.7	29.1	35.5	26.6	37.8
8 25 PCT T		24.8	65	19.0	.768	8.9	.068	.467	2000	14.6	4.9	8.2	6.9	8.0	7.4
9 C.T.		0.0	0	3.7	R	R	.063	R	2000	15.8	23.0	5.3	.0	2.9	0.0
1 25 PCT T		24.0	63	19.2	.800	8.9	.068	.487	2000	14.8	5.1	7.8	7.5	8.7	7.2
2 55 PCT T		53.3	140	29.0	.544	12.1	.068	.331	2000	14.8	15.2	20.6	42.9	25.0	30.4
3 25 PCT T		25.1	66	19.0	.756	8.7	.067	.460	2000	14.9	4.6	7.8	7.7	8.6	7.5
4 10 PCT T		11.0	29	15.0	1.358	6.7	.065	.826	2000	15.4	2.8	3.3	1.9	5.0	2.4
5 25 PCT T		24.0	63	18.9	.788	9.0	.068	.479	2000	14.6	4.8	8.0	7.6	8.5	7.2
6 90 PCT T		84.4	223	42.5	.492	5.5	.070	.299	2000	14.3	14.5	30.5	24.5	28.1	37.9
7 25 PCT T		24.8	65	18.8	.760	9.0	.069	.462	2000	14.6	4.4	8.1	7.8	8.5	7.4
8 C.T.		0.0	0	3.6	R	R	.064	R	2000	15.6	24.0	4.8	.0	3.0	0.0
9 IDLE		0.0	0	3.4	R	R	.068	R	980	14.7	24.6	9.2	.0	4.6	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 8.7 80 13.8

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 9.3 81 11.4

TWO CYCLE COMPOSITE -

HC- FID 0.35(8.7) + 0.65(9.3) = 9.059 G/KW HR (6.755 BS)

CO- NDIR 0.35(80.3) + 0.65(81.2) = 80.898 G/KW HR (60.326 BS)

NOX-CL 0.35(13.8) + 0.65(11.4) = 12.283 G/KW HR (9.160 BS)

HC + NOX = 21.342 G/KW HR (15.915 BS)

SFC = .413 KG/KW HR (.679 BS)

TABLE B-15A. ENGINE 4 NINE-MODE EMISSIONS RESULTS

1969 IH304#2-- PROJECT 11-5044-001 PAR=29.40

11 20 78 TEST #3 IH304 K= .922 HUM= 7.9 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	29952	8,100	7.08	R	18,509	1905	343	1684	0	.232	R	R	R	0.0
2 25 PCT T	2680	2,610	12.92	753	15,836	7802	151	2597	114	.077	7,079	121,797	5,326	15.9
3 55 PCT T	2392	1,930	13.32	2028	15,523	11929	210	2996	477	.147	4,415	62,940	10,025	35.5
4 25 PCT T	2432	2,670	12.90	877	15,848	7484	131	2547	127	.077	6,271	121,609	6,055	15.6
5 10 PCT T	2144	2,630	12.90	346	15,775	5443	85	1833	37	.057	9,254	200,569	4,000	6.8
6 25 PCT T	2368	2,750	12.90	814	15,921	7348	125	2564	115	.077	5,970	122,413	5,492	15.6
7 90 PCT T	2200	3,700	12.56	1106	16,512	18280	279	8294	375	.113	3,721	110,293	4,997	55.9
8 25 PCT T	2512	2,980	12.78	836	16,047	7394	132	2773	118	.077	6,101	127,772	5,433	16.2
9 C.T.	239440	3,820	2.28	9	30,840	2268	1819	567	0	.143	R	R	R	0.0
1 25 PCT T	3448	2,950	12.76	811	16,104	7348	180	2719	113	.077	8,592	129,820	5,410	15.6
2 55 PCT T	2648	2,290	13.17	1903	15,763	11657	224	3421	431	.147	4,783	73,036	9,200	34.9
3 25 PCT T	2640	2,970	12.85	850	16,122	7348	138	2734	119	.077	6,459	128,224	5,563	15.9
4 10 PCT T	1968	2,150	13.22	400	15,595	5262	76	1465	41	.057	7,669	147,995	4,174	7.4
5 25 PCT T	2496	2,860	12.85	836	15,996	7257	130	2621	116	.077	6,301	127,469	5,648	15.3
6 90 PCT T	2296	3,730	12.49	1148	16,483	18370	293	8397	392	.113	3,849	110,258	5,144	56.8
7 25 PCT T	2440	2,900	12.85	905	16,029	7439	130	2719	129	.077	5,672	118,984	5,628	17.0
8 C.T.	233600	3,750	2.10	16	30,134	2132	1718	596	0	.143	R	R	R	0.0
9 IDLE	38272	9,450	6.59	16	20,289	1905	349	1742	0	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	4.2	R	R	.094	R	480	10.7	17.7	14.2	.0	6.1	0.0
2 25 PCT T		21.3	56	17.2	.807	5.3	.073	.491	2000	13.8	2.6	7.2	5.8	8.3	7.3
3 55 PCT T		47.6	125	26.3	.553	10.0	.071	.336	2000	14.1	6.9	16.0	46.4	24.3	31.1
4 25 PCT T		20.9	55	16.5	.788	6.1	.073	.479	2000	13.7	2.3	7.1	6.5	8.0	7.2
5 10 PCT T		9.1	24	12.0	1.313	4.0	.072	.799	2000	13.8	1.1	3.8	1.4	4.3	2.3
6 25 PCT T		20.9	55	16.2	.773	5.5	.073	.470	2000	13.7	2.1	7.2	5.9	7.8	7.2
7 90 PCT T		75.0	197	40.3	.537	5.0	.076	.327	2000	13.1	7.0	33.9	28.0	28.7	37.6
8 25 PCT T		21.7	57	16.3	.751	5.4	.074	.457	2000	13.5	2.3	7.7	6.0	7.9	7.4
9 C.T.		0.0	0	5.0	R	R	.201	R	2000	5.0	58.0	2.9	.0	4.5	0.0
1 25 PCT T		20.9	55	16.2	.773	5.4	.074	.470	2000	13.5	3.1	7.3	5.9	8.0	7.1
2 55 PCT T		46.8	123	25.9	.549	9.2	.072	.334	2000	13.9	7.3	17.6	43.1	24.1	30.4
3 25 PCT T		21.3	56	16.2	.760	5.6	.074	.462	2000	13.5	2.3	7.4	6.2	8.0	7.2
4 10 PCT T		9.9	26	11.6	1.172	4.2	.071	.713	2000	14.0	1.0	2.9	1.6	4.2	2.5
5 25 PCT T		20.6	54	16.0	.778	5.6	.074	.473	2000	13.6	2.2	7.1	6.1	7.9	7.0
6 90 PCT T		76.2	200	40.5	.532	5.1	.076	.323	2000	13.1	7.3	33.2	30.1	29.2	38.0
7 25 PCT T		22.8	60	16.4	.718	5.6	.074	.437	2000	13.6	2.2	7.3	6.7	8.1	7.8
8 C.T.		0.0	0	4.7	R	R	.196	R	2000	5.1	54.2	2.7	.0	4.3	0.0
9 IDLE		0.0	0	4.2	R	R	.106	R	500	9.5	20.4	14.5	.1	6.2	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 26.7 169 9.0

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 26.8 169 8.7

TWO CYCLE COMPOSITE -

HC- FID 0.35(26.7) + 0.65(26.8) = 26.773 G/KW HR (19.965 83)

CO- NDIR 0.35(169.2) + 0.65(169.2) = 167.466 G/KW HR (124.879 83)

NOX-CL 0.35(9.0) + 0.65(8.7) = 8.798 G/KW HR (6.560 83)

HC + NOX = 35.571 G/KW HR (26.525 83)

SFC = .423 KG/KW HR (.696 83)

TABLE B-15B. ENGINE 4 NINE-MODE EMISSIONS RESULTS

11 21 78 TEST 45 1969 IH304#2-- PROJECT 11-5044-001 IH304 BAR=29.15 K= .915 HUM= 7.7 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	34304	8.060	6.95	0	18.816	1769	358	1531	0	.232	R	R	I	0.0
2 25 PCT T	2944	2.950	12.73	669	16.017	7711	162	2869	98	.077	7,736	136,978	4,671	15.6
3 55 PCT T	2448	2.110	13.10	1842	15,490	11703	211	3220	423	.147	4,436	67,650	8,880	35.5
4 25 PCT T	2472	2.940	12.73	805	15,852	7439	133	2692	115	.077	6,106	124,023	5,286	16.2
5 10 PCT T	2160	2.230	13.10	336	15,577	5398	86	1561	35	.057	8,637	157,657	3,572	7.4
6 25 PCT T	2640	2.870	12.73	790	15,902	7394	140	2696	112	.077	6,577	126,401	5,232	15.9
7 90 PCT T	2400	3.700	12.44	1116	16,415	18280	306	8323	377	.113	3,997	108,740	4,932	57.1
8 25 PCT T	2664	2.850	12.73	850	15,884	7303	140	2647	119	.077	6,562	124,115	5,566	15.9
9 C.T.	314880	3.220	1.81	6	37,589	2268	1964	392	0	.143	R	R	R	0.0
1 25 PCT T	3984	2.920	12.68	736	16,055	7394	210	2716	103	.077	10,008	129,690	4,915	15.6
2 55 PCT T	2920	2.240	12.97	1871	15,543	11703	251	3407	428	.147	5,229	71,001	8,917	35.8
3 25 PCT T	2824	2.950	12.61	796	15,882	7348	149	2757	112	.077	7,124	131,634	5,341	15.6
4 10 PCT T	2384	2.560	12.85	323	15,682	5352	93	1765	33	.057	9,761	185,390	3,517	7.1
5 25 PCT T	2680	2.840	12.66	849	15,806	7484	145	2716	121	.077	6,918	129,697	5,789	15.6
6 90 PCT T	2400	3.360	12.61	1304	16,245	18144	307	7581	442	.113	4,027	99,534	5,808	56.8
7 25 PCT T	2528	2.690	12.73	919	15,709	7257	133	2510	129	.077	6,143	115,657	5,941	16.2
8 C.T.	191360	4.610	3.02	12	27,782	2268	1645	760	0	.143	R	R	R	0.0
9 IDLE	36096	9.680	6.56	12	20,248	2132	422	2059	0	.232	R	R	R	0.0

MODE	ID	UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	3.9	R	I	.096	R	470	10.4	17.3	12.9	0.0	5.8	0.0
2 25 PCT T		20.9	55	17.0	.812	4.7	.074	.494	2000	13.6	2.6	8.0	5.3	8.3	7.1
3 55 PCT T		47.6	125	25.8	.542	8.9	.071	.330	2000	14.1	6.5	17.2	44.1	24.1	30.7
4 25 PCT T		21.7	57	16.4	.756	5.3	.073	.460	2000	13.7	2.1	7.5	6.3	8.0	7.3
5 10 PCT T		9.9	26	11.9	1.202	3.6	.071	.731	2000	14.0	1.0	3.2	1.4	4.3	2.5
6 25 PCT T		21.3	54	16.3	.764	5.2	.073	.468	2000	13.7	2.3	7.5	6.1	8.0	7.2
7 90 PCT T		76.5	201	40.3	.526	4.9	.076	.320	2000	13.2	7.2	34.2	30.3	29.0	38.0
8 25 PCT T		21.3	54	16.1	.755	5.6	.073	.459	2000	13.7	2.3	7.4	6.5	7.9	7.2
9 C.T.		0.0	0	5.0	R	R	.274	R	2000	3.7	58.7	2.0	.0	4.6	0.0
1 25 PCT T		20.9	55	16.3	.778	4.9	.074	.473	2000	13.5	3.5	7.3	5.3	7.9	7.1
2 55 PCT T		48.0	126	25.8	.538	8.9	.071	.327	2000	14.0	8.0	17.5	41.7	24.0	31.1
3 25 PCT T		20.9	55	16.2	.773	5.3	.073	.470	2000	13.7	2.5	7.4	5.7	7.9	7.1
4 10 PCT T		9.5	25	11.8	1.239	3.5	.072	.754	2000	13.9	1.2	3.5	1.3	4.3	2.4
5 25 PCT T		20.9	55	16.5	.788	5.8	.073	.479	2000	13.8	2.4	7.3	6.2	8.0	7.1
6 90 PCT T		76.2	200	40.0	.525	5.8	.075	.319	2000	13.3	7.6	29.9	33.2	28.6	37.9
7 25 PCT T		21.7	57	16.0	.737	5.9	.072	.448	2000	13.9	2.2	6.7	6.6	7.8	7.4
8 C.T.		0.0	0	5.0	R	R	.171	R	2000	5.8	51.2	3.8	.0	4.5	0.0
9 IDLE		0.0	0	4.7	R	R	.105	R	450	9.5	21.3	16.7	.1	6.9	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 28.2 162 8.3
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 27.1 169 8.9

TWO CYCLE COMPOSITE -

HC- FID 0.35(28.2) + 0.65(27.1) = 27.481 G/KW HR (20.493 BS)
CO- NDIR 0.35(162.1) + 0.65(169.4) = 166.821 G/KW HR (124.398 BS)
NOX-CL 0.35(8.3) + 0.65(8.9) = 8.688 G/KW HR (6.479 BS)
HC + NOX = 36.169 G/KW HR (26.972 BS)
SFC = .422 KG/KW HR (.693 BS)

TABLE B-16A. ENGINE 5 NINE-MODE EMISSIONS RESULTS

1969 CHEV 366 -- PROJECT 11-5044-0 BAR=29.04

12 19 78 336 PM TEST 53 CHEV 366 KH .976 HUM= 9.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	12832	4.640	9.90	21	15.984	1814	164	1064	1	.232	R	R	R	0.0
2 25 PCT T	2160	3.740	12.49	331	16.477	10841	163	4990	71	.077	6.382	194.812	2.765	14.0
3 55 PCT T	2064	3.550	12.73	836	16.517	16103	231	6991	264	.147	4.041	122.392	4.623	42.6
4 25 PCT T	1880	3.460	12.80	411	16.476	10433	137	4426	84	.077	5.352	173.460	3.305	14.0
5 10 PCT T	1360	2.030	13.66	290	15.846	7711	76	1995	46	.057	7.120	187.145	4.288	8.0
6 25 PCT T	1944	3.740	12.49	386	16.453	10659	144	4895	81	.077	5.413	183.618	3.039	14.9
7 90 PCT T	2176	4.310	12.25	787	16.809	22680	337	11747	344	.113	3.638	126.940	3.718	64.0
8 25 PCT T	2000	4.030	12.37	386	16.629	10750	148	5263	81	.077	5.559	197.422	3.033	14.9
9 C.T.	80000	4.200	6.73	12	19.665	2495	1108	1076	0	.143	R	R	R	0.0
1 25 PCT T	2480	4.800	11.79	300	16.874	10886	183	6255	63	.077	6.870	234.667	2.352	14.9
2 55 PCT T	2000	3.600	12.61	836	16.439	15876	221	7023	262	.147	3.875	122.945	4.579	42.6
3 25 PCT T	2344	5.230	11.67	263	17.169	11113	174	6838	55	.077	6.521	256.536	2.069	14.9
4 10 PCT T	1960	3.490	12.61	209	16.302	7847	97	3394	33	.057	8.495	297.051	2.853	8.5
5 25 PCT T	2120	4.250	11.79	310	16.783	10886	157	6224	65	.077	5.904	233.485	2.444	14.9
6 90 PCT T	2120	4.410	12.18	725	16.833	22226	321	11762	310	.113	3.468	127.110	3.351	64.0
7 25 PCT T	2400	5.100	11.65	271	17.025	10795	174	6533	56	.077	6.536	245.064	2.089	14.9
8 C.T.	84800	4.100	6.56	12	19.901	2495	1158	1038	0	.143	R	R	R	0.0
9 IDLE	24800	5.610	9.38	24	17.780	1724	270	1099	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	4.0	R	R	.076	R	470	13.1	11.9	5.6	.2	4.5	0.0
2 25 PCT T		25.9	67	23.9	.937	2.8	.076	.570	2000	13.1	3.9	8.7	5.2	8.8	7.1
3 55 PCT T		57.1	150	35.5	.621	4.6	.076	.378	2000	13.1	10.7	23.5	37.0	25.1	30.5
4 25 PCT T		25.9	67	23.0	.901	3.3	.076	.548	2000	13.2	3.3	7.8	6.2	8.5	7.1
5 10 PCT T		10.9	28	17.0	1.594	4.3	.072	.970	2000	13.9	1.4	2.6	2.5	4.7	2.2
6 25 PCT T		26.9	70	23.5	.882	3.0	.076	.536	2000	13.1	3.5	8.6	5.9	8.7	7.5
7 90 PCT T		92.5	243	50.0	.540	3.7	.078	.329	2000	12.8	11.9	30.3	37.0	27.2	38.0
8 25 PCT T		26.9	70	23.9	.889	3.0	.077	.541	2000	13.0	3.6	9.3	5.9	8.8	7.5
9 C.T.		0.0	0	5.5	R	R	.102	R	2000	9.8	44.8	3.5	.1	3.8	0.0
1 25 PCT T		26.9	70	24.0	.900	2.4	.079	.548	2000	12.7	4.0	9.7	5.1	8.9	7.4
2 55 PCT T		57.1	150	35.0	.613	4.6	.076	.373	2000	13.2	9.1	20.9	40.9	24.8	30.3
3 25 PCT T		26.9	70	24.5	.919	2.1	.080	.559	2000	12.4	3.8	10.6	4.5	9.1	7.4
4 10 PCT T		11.4	30	17.3	1.514	2.9	.075	.921	2000	13.3	1.6	3.9	2.0	4.8	2.3
5 25 PCT T		26.9	70	24.0	.900	2.4	.078	.548	2000	12.8	3.4	9.7	5.3	8.9	7.4
6 90 PCT T		92.5	243	49.0	.530	3.4	.078	.322	2000	12.8	10.2	26.9	37.3	26.7	37.7
7 25 PCT T		26.9	70	23.8	.893	2.1	.080	.543	2000	12.5	3.8	10.2	4.6	8.8	7.4
8 C.T.		0.0	0	5.5	R	R	.104	R	2000	9.6	46.6	3.0	.1	3.8	0.0
9 IDLE		0.0	0	3.8	R	R	.087	R	500	11.5	17.6	5.2	.2	4.2	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 15.5 213 5.1

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 17.2 239 4.5

TWO CYCLE COMPOSITE -

HC- FID 0.35(15.5) + 0.65(17.2) = 16.623 G/KW HR (12.396 BS)

CO- NDIR 0.35(213.4) + 0.65(239.5) = 230.329 G/KW HR (171.756 BS)

NOX-CL 0.35(5.1) + 0.65(4.5) = 4.747 G/KW HR (3.540 BS)

HC + NOX = 21.370 G/KW HR (15.936 BS)

SFC = .457 KG/KW HR (.751 BS)

TABLE B-16B. ENGINE 5 NINE-MODE EMISSIONS RESULTS

12 20 78 1:37 PM TEST 54 — 1969 CHEV 366 -- PROJECT 11-5044-0 — BAR=28.95 K= .979 HUM= 9.9 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	9888	5.580	9.69	24	16.386	2268	154	1560	1	.232	R	R	R	0.0
2 25 PCT T	2000	3.870	12.37	295	16.469	10433	145	4952	61	.077	5.605	191.237	2.347	19.3
3 55 PCT T	2080	3.610	12.61	803	16.458	16420	238	7275	261	.147	4.083	124.867	4.471	43.4
4 25 PCT T	2000	3.930	12.49	333	16.649	10206	141	4866	66	.077	5.431	187.923	2.563	19.3
5 10 PCT T	1560	2.580	13.22	230	15.979	7802	87	2545	37	.057	7.166	208.816	2.997	9.1
6 25 PCT T	2000	3.990	12.37	322	16.589	10299	142	5003	65	.077	5.495	193.186	2.510	19.3
7 90 PCT T	2184	4.470	12.14	750	16.860	23133	344	12389	335	.113	3.653	131.712	3.558	70.1
8 25 PCT T	2024	4.080	12.37	342	16.682	10795	150	5393	72	.077	5.800	205.963	2.779	19.3
9 C.T.	98560	4.200	6.06	10	20.956	2631	1343	1065	0	.143	R	R	R	0.0
1 25 PCT T	2584	4.390	12.02	299	16.706	10523	186	5586	61	.077	7.197	215.718	2.365	19.3
2 55 PCT T	2136	3.640	12.61	852	16.495	16239	241	7299	273	.147	4.111	123.431	4.651	43.7
3 25 PCT T	2216	4.510	12.02	287	16.784	10523	159	5712	59	.077	6.058	217.388	2.227	19.6
4 10 PCT T	1960	3.060	12.73	215	15.991	7847	99	3033	34	.057	7.866	241.367	2.730	9.4
5 25 PCT T	2120	4.210	12.14	309	16.593	10569	155	5417	64	.077	5.972	209.181	2.472	19.3
6 90 PCT T	2200	4.430	12.02	748	16.702	23133	349	12394	337	.113	3.665	130.190	3.839	71.0
7 25 PCT T	2264	4.940	11.77	259	16.969	10659	163	6268	52	.077	6.291	242.066	2.027	19.3
8 C.T.	79360	4.660	6.47	10	19.792	2948	1290	1402	0	.143	R	R	R	0.0
9 IDLE	24960	5.440	10.44	20	18.713	1633	247	959	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	5.0	R	R	.078	R	500	12.8	10.2	7.7	.3	5.5	0.0
2 25 PCT T		25.9	68	23.0	.888	2.3	.076	.540	2000	13.1	3.2	8.1	4.7	8.4	7.2
3 55 PCT T		58.3	153	36.2	.621	4.5	.076	.378	2000	13.2	10.0	22.8	38.7	25.2	30.7
4 25 PCT T		25.9	68	22.5	.869	2.6	.077	.529	2000	13.0	3.1	8.0	5.2	8.2	7.2
5 10 PCT T		12.2	32	17.2	1.411	3.0	.073	.859	2000	13.7	1.4	3.1	2.1	4.6	2.5
6 25 PCT T		25.9	68	22.7	.877	2.5	.077	.533	2000	13.0	3.1	8.2	5.1	8.3	7.2
7 90 PCT T		94.1	247	51.0	.542	3.6	.078	.330	2000	12.8	11.1	29.9	38.3	27.3	38.1
8 25 PCT T		25.9	68	23.8	.919	2.8	.077	.559	2000	12.9	3.3	8.8	5.6	8.7	7.2
9 C.T.		0.0	0	5.8	R	R	.112	R	2000	8.9	54.7	3.3	.1	3.9	0.0
1 25 PCT T		25.9	68	23.2	.896	2.4	.078	.545	2000	12.9	3.8	8.9	4.8	8.5	7.1
2 55 PCT T		58.6	154	35.8	.610	4.7	.076	.371	2000	13.1	9.5	22.0	40.7	25.1	30.7
3 25 PCT T		26.3	69	23.2	.883	2.2	.078	.537	2000	12.8	3.3	9.1	4.6	8.5	7.2
4 10 PCT T		12.6	33	17.3	1.377	2.7	.074	.837	2000	13.6	1.5	3.6	2.0	4.7	2.5
5 25 PCT T		25.9	68	23.3	.900	2.5	.077	.547	2000	13.0	3.2	8.6	5.0	8.6	7.1
6 90 PCT T		95.2	250	51.0	.536	3.5	.078	.326	2000	12.9	10.6	29.0	38.6	27.5	38.3
7 25 PCT T		25.9	68	23.5	.907	2.0	.079	.552	2000	12.6	3.4	10.0	4.1	8.6	7.1
8 C.T.		0.0	0	6.5	R	R	.104	R	2000	9.7	49.4	4.2	.1	4.4	0.0
9 IDLE		0.0	0	3.6	R	R	.091	R	440	11.0	15.4	4.6	.1	4.0	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 16.9 225 4.8
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 17.8 231 4.7

TWO CYCLE COMPOSITE -

HC- FID	0.35(16.9) + 0.65(17.8) =	17.499	G/KW	HR	(13.049	BS)
CO- NDIR	0.35(225.3) + 0.65(230.5) =	228.677	G/KW	HR	(170.525	BS)
NOX-CL	0.35(4.8) + 0.65(4.7) =	4.721	G/KW	HR	(3.520	BS)
	HC + NOX =	22.220	G/KW	HR	(16.569	BS)
	SFC =	.456	KG/KW	HR	(.750	BS)

TABLE B-17A. ENGINE 9 NINE-MODE EMISSIONS RESULTS

03 16 79 TEST 92 1969 CH366 -- PROJECT 11-5044-0 BAR= 29.39 K= .855 HUM= 5.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	19648	4.330	7.35	10	13.839	2945	389	1577	1	.232	R	R	R	0.0
2 25 PCT T	2880	4.750	11.10	184	16.178	11567	234	6860	37	.077	10.985	321.694	1.751	15.9
3 55 PCT T	2584	5.750	11.15	375	17.195	18325	315	12378	113	.147	5.368	211.071	1.934	43.7
4 25 PCT T	1960	3.900	12.02	315	16.144	11476	159	5600	64	.077	6.056	213.128	2.419	19.6
5 10 PCT T	1040	1.510	13.22	240	14.849	8255	66	1696	38	.057	6.410	164.935	3.683	7.7
6 25 PCT T	2024	4.450	11.56	271	16.241	11793	168	6527	56	.077	6.200	241.423	2.066	20.2
7 90 PCT T	2304	5.070	11.61	610	16.944	24948	388	15079	255	.113	3.997	155.287	2.625	72.4
8 25 PCT T	1980	3.900	12.02	325	16.135	11294	150	5515	65	.077	5.720	209.877	2.457	19.6
9 C.T.	47360	2.830	5.57	5	13.487	2722	1027	1154	0	.143	R	R	R	0.0
1 25 PCT T	1968	2.490	12.73	470	15.445	10886	158	3545	94	.077	5.937	132.999	3.527	19.9
2 55 PCT T	2376	4.640	11.67	570	16.581	17690	290	9999	173	.147	5.004	172.754	2.982	43.2
3 25 PCT T	1720	2.660	12.61	455	15.466	10886	138	3782	91	.077	5.333	146.053	3.510	19.3
4 10 PCT T	960	1.290	13.22	250	14.619	7983	60	1423	39	.057	6.269	149.468	4.070	7.1
5 25 PCT T	1760	3.120	12.25	410	15.571	11249	145	4553	84	.077	5.438	170.810	3.154	19.9
6 90 PCT T	2320	5.510	11.44	535	17.216	25764	397	16657	227	.113	4.061	170.199	2.322	73.0
7 25 PCT T	1744	3.160	12.34	400	15.699	10886	138	4426	79	.077	5.252	168.457	2.996	19.6
8 C.T.	51200	2.750	6.06	5	14.332	2722	1049	1055	0	.143	R	R	R	0.0
9 IDLE	18240	5.180	7.72	10	14.918	2449	331	1718	0	.232	R	R	R	0.0

MODE	ID	UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	5.5	R	R	.067	R	430	14.9	23.4	6.1	.2	5.5	0.0
2 25 PCT T		21.3	56	25.5	1.196	1.8	.076	.727	2000	13.2	4.7	8.7	4.4	8.5	5.9
3 55 PCT T		58.6	154	40.4	.689	1.9	.081	.419	2000	12.3	12.0	30.1	25.7	25.6	30.8
4 25 PCT T		26.3	69	25.3	.963	2.4	.075	.586	2000	13.4	3.2	7.1	7.5	8.4	7.2
5 10 PCT T		10.3	27	18.2	1.770	3.7	.068	1.077	2000	14.8	1.0	1.6	3.3	4.5	2.1
6 25 PCT T		27.0	71	26.0	.962	2.1	.076	.585	2000	13.2	3.3	8.3	6.6	8.6	7.4
7 90 PCT T		97.1	255	55.0	.566	2.6	.079	.345	2000	12.6	11.4	28.2	44.4	26.8	34.3
8 25 PCT T		26.3	69	24.9	.948	2.5	.075	.576	2000	13.4	3.0	7.0	7.7	8.3	7.2
9 C.T.		0.0	0	6.0	R	R	.067	R	2000	14.8	38.1	2.7	.1	3.7	0.0
1 25 PCT T		26.7	70	24.0	.900	3.5	.071	.548	2000	14.1	3.4	5.2	9.0	8.1	7.3
2 55 PCT T		57.9	152	39.0	.674	3.0	.077	.410	2000	12.9	11.8	28.1	31.6	25.2	30.1
3 25 PCT T		25.9	68	24.0	.927	3.5	.071	.564	2000	14.1	2.9	5.6	8.7	8.1	7.1
4 10 PCT T		9.8	25	17.6	1.849	4.1	.066	1.125	2000	15.1	.9	1.5	2.8	4.4	1.9
5 25 PCT T		26.7	70	24.8	.930	3.2	.072	.566	2000	13.9	3.1	6.7	8.1	8.4	7.3
6 90 PCT T		97.9	259	56.8	.580	2.3	.081	.353	2000	12.4	12.4	35.9	32.0	28.3	34.2
7 25 PCT T		26.3	69	24.0	.913	3.0	.072	.556	2000	13.8	2.9	6.5	7.6	8.1	7.2
8 C.T.		0.0	0	6.0	R	R	.072	R	2000	13.9	41.4	2.9	.0	3.8	0.0
9 IDLE		0.0	0	5.4	R	R	.073	R	480	13.8	21.2	7.6	.1	5.5	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 18.5 290 3.1
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 17.2 249 3.8

TWO CYCLE COMPOSITE -

HC- FID	0.35(18.5) + 0.65(17.2) =	17.665	G/KW HR	(13.172	BS)
CO- NDIR	0.35(289.7) + 0.65(248.8) =	263.118	G/KW HR	(196.207	BS)
NOX-CL	0.35(3.1) + 0.65(3.8) =	3.564	G/KW HR	(2.658	BS)
	HC + NOX =	21.229	G/KW HR	(15.830	BS)
	SFC =	.495	KG/KW HR	(.813	BS)

TABLE B-17B. ENGINE 9 NINE-MODE EMISSIONS RESULTS

1969 CH366 -- PROJECT 11-5044-0

BAR=29.06

03 19 79 TEST 93 K= 1.003 HUM= 10.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	15552	3.970	7.53	10	13.210	2722	352	1652	1	.232	R	R	R	0.0
2 25 PCT T	2440	5.360	10.88	169	16.518	12247	206	8028	42	.077	7,960	310,009	1.611	19.3
3 55 PCT T	2480	5.440	11.33	393	17.054	18144	302	11691	139	.147	5,285	204,673	2.436	42.6
4 25 PCT T	2280	5.310	11.21	187	16.780	11703	182	7480	43	.077	7,014	288,877	1.676	19.3
5 10 PCT T	1160	1.620	13.22	210	14.972	7983	71	1745	37	.057	7,415	183,277	3.915	7.1
6 25 PCT T	2032	4.270	11.78	245	16.282	11476	164	6079	57	.077	6,413	238,272	2.253	19.0
7 90 PCT T	2400	5.650	11.44	473	17.365	25855	410	16993	234	.113	4,355	180,660	2.492	70.1
8 25 PCT T	1920	3.470	12.25	300	15.939	10886	150	4787	68	.077	5,787	184,872	2.634	19.3
9 C.T.	48000	3.080	6.73	10	15.030	3039	1055	1258	1	.143	R	R	R	0.0
1 25 PCT T	2224	3.300	12.37	300	15.924	11068	177	4633	69	.077	6,823	178,916	2.680	19.3
2 55 PCT T	2480	5.400	11.44	405	17.124	17690	293	11269	139	.147	5,136	197,276	2.438	42.6
3 25 PCT T	2096	4.100	11.93	265	16.270	10977	162	5588	60	.077	6,243	215,787	2.298	19.3
4 10 PCT T	1280	1.820	13.10	198	15.066	7893	77	1926	35	.057	8,039	202,298	3.626	7.1
5 25 PCT T	2000	3.800	12.02	280	16.048	11068	158	5294	64	.077	6,086	204,429	2.482	19.3
6 90 PCT T	2400	5.580	11.56	490	17.415	25174	398	16293	236	.113	4,336	177,538	2.569	68.4
7 25 PCT T	2000	3.900	12.14	300	16.269	10795	152	5228	66	.077	5,951	204,891	2.597	19.0
8 C.T.	52480	2.990	6.73	12	15.425	2268	839	888	1	.143	R	R	R	0.0
9 IDLE	20160	4.470	8.09	15	14.793	1950	294	1191	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	6.0	R	R	.064	R	450	15.7	21.4	6.1	.2	5.9	0.0
2 25 PCT T		25.9	68	27.0	1.043	1.6	.078	.634	2000	12.9	4.2	9.8	4.9	8.8	7.2
3 55 PCT T		57.1	150	40.0	.700	2.4	.080	.426	2000	12.5	11.6	27.1	31.2	25.0	30.5
4 25 PCT T		25.9	68	25.8	.996	1.7	.079	.606	2000	12.7	3.7	9.1	5.1	8.4	7.2
5 10 PCT T		9.5	25	17.6	1.849	3.9	.068	1.125	2000	14.7	1.1	1.6	3.2	4.3	2.0
6 25 PCT T		25.5	67	25.3	.992	2.3	.076	.603	2000	13.2	3.3	7.4	6.8	8.3	7.1
7 90 PCT T		94.1	247	57.0	.606	2.5	.082	.369	2000	12.2	12.1	30.3	40.4	27.4	38.6
8 25 PCT T		25.9	68	24.0	.927	2.6	.074	.564	2000	13.6	3.0	5.8	8.0	7.9	7.2
9 C.T.		0.0	0	6.7	R	R	.075	R	2000	13.4	39.6	2.8	.1	4.1	0.0
1 25 PCT T		25.9	68	24.4	.942	2.7	.073	.573	2000	13.6	4.1	6.4	7.7	8.5	7.3
2 55 PCT T		57.1	150	39.0	.683	2.4	.080	.415	2000	12.4	13.0	29.5	29.5	25.9	30.8
3 25 PCT T		25.9	68	24.2	.935	2.3	.076	.568	2000	13.2	3.8	7.7	6.6	8.4	7.3
4 10 PCT T		9.5	25	17.4	1.828	3.6	.069	1.112	2000	14.6	1.3	2.0	2.8	4.5	2.0
5 25 PCT T		25.9	68	24.4	.942	2.5	.074	.573	2000	13.4	3.7	7.3	7.1	8.5	7.3
6 90 PCT T		91.8	241	55.5	.605	2.6	.082	.368	2000	12.2	13.6	32.8	38.4	28.3	38.0
7 25 PCT T		25.5	67	23.8	.933	2.6	.075	.567	2000	13.3	3.5	7.2	7.4	8.3	7.2
8 C.T.		0.0	0	5.0	R	R	.077	R	2000	13.0	36.3	2.3	.1	3.2	0.0
9 IDLE		0.0	0	4.3	R	R	.072	R	520	14.0	20.7	4.9	.2	4.5	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 18.6 309 3.2

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 16.3 276 3.4

TWO CYCLE COMPOSITE -

HC- FID 0.35(18.6) + 0.65(16.3) = 17.077 G/KW HR (12.735 BS)

CO- NDIR 0.35(308.6) + 0.65(275.9) = 287.357 G/KW HR (214.282 BS)

NOX-CL 0.35(3.2) + 0.65(3.4) = 3.334 G/KW HR (2.486 BS)

HC + NOX = 20.412 G/KW HR (15.221 BS)

SFC = .504 KG/KW HR (.828 BS)

APPENDIX C

NO_x BASELINE SUMMARIES OF THE RESULTS

Table Number	Engine Number	Description
		Summary of the Results
C-1	14	1971 Ford 361
C-2	15	1972 Dodge 413
C-3	16	1973 Chevrolet 454
C-4	17	1973 GMC 427
C-5	18	1972 Chevrolet 350
C-6	19	1972 IHC 345
C-7	20	1972 Ford 300
C-8	21	1973 IHC 304
C-9	22	1973 GMC 366
C-10	11[a]	1973 GMC 366

[a] Engine 11 was retested as Engine 22.

TABLE C-1. ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

TRANSIENT CYCLE

		TEST 14-2			TEST 14-4			Avg. of
		Cold	Hot	Composite	Cold	Hot	Composite	3 Tests
HC,	g/kW-hr	22.78	12.94	14.35	21.40	14.23	15.25	14.73
CO,	g/kW-hr	245.31	203.35	209.34	243.45	206.81	212.04	215.83
CO_2,	g/kW-hr	971	990	987	960	870	883	937
NOX,	g/kW-hr	5.99	6.82	6.70	6.18	6.06	6.08	6.24
SFC,	kg/kW-hr	0.450	0.426	0.429	0.445	0.391	0.399	0.417
WORK,	kW-hr	7.5	7.55	7.54	7.56	7.60	7.59	7.60
POWER,	kW	23.14	23.29	23.27	23.32	23.45	23.43	23.44

NINE MODE

		Test 14-1	Test 14-3	Test 14-4	Avg.
HC,	g/kW-hr	10.97	10.10	11.49	10.85
CO,	g/kW-hr	117.78	121.96	121.03	120.26
CO_2,	g/kW-hr	997.13	982.28	987.6	989.00
NOX,	g/kW-hr	7.97	9.04	8.73	8.58
SFC,	kg/kW-hr	0.424	0.413	0.407	0.415
POWER,	kW	21.5	21.2	21.4	21.4

IDLE

		Test 14-5C	Test 14-6	Average
RPM		550	550	550
HC,	ppmC	13460	10620	12040
CO,	%	4.5	4.2	4.4
CO_2,	%	11.0	10.6	10.8
Fuel,	kg/hr	1.9	1.8	1.9

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	14.73	(10.98)	HC 35.32	10.75
CO,	g/kW-hr	(g/hp-hr)	215.83	(160.94)	CO 517.58	157.57
NOX,	g/kW-hr	(g/hp-hr)	6.24	(4.65)	NOX 14.96	4.56
SFC,	kg/kW-hr	(lb/hp-hr)	0.417	(0.686)		
WORK,	kW-hr	(hp-hr)	7.60	(10.19)	FUEL CONS. ---	304.

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-1 (Cont'd.) ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 14-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	40.	11.%	6.%	38.	9.%	4.%
Slope	1.001	.973	.999	.995	.968	.998
Corr. Coef.	.9980	.9055	.9652	.9981	.9300	.9770
Intercept	-6.	4.4	.6	10.	2.0	-.1
Points Used	1094	1041	1041	1144	1116	1116
kW-hr Dev.[b]	----------	-1.0	----------	----------	-0.4	----------
TEST 14-4						
Standard Error	38.	10.%	6.%	38.	8.%	4.%
Slope	1.001	.994	1.007	.998	.996	1.006
Corr. Coef.	.9981	.9178	.9618	.9981	.9410	.9735
Intercept	-6.	3.1	.6	5.	.3	-.1
Points Used	1144	1071	1071	1144	1107	1107
kW-hr Dev.[b]	----------	-0.2	----------	----------	0.3	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
Test 14-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	58.60	52.97	39.35	20.85	20.15	27.17	33.32	17.04
CO, gram	226.91	420.00	993.80	199.63	182.46	282.28	888.50	181.49
CO_2, gram	860.3	1591.0	4091.8	742.2	729.4	1527.0	4234.3	981.49
NOX, gram	4.42	10.19	26.25	4.08	4.14	13.07	30.35	3.93
FUEL, kg	0.442	0.762	1.822	0.354	0.340	0.648	1.808	0.417
KW-HR	0.60	1.43	4.86	0.61	0.62	1.45	4.87	0.61
TEST 14-4								
HC, gram	48.08	48.36	40.10	25.32	24.08	30.85	32.93	20.26
CO, gram	216.72	415.14	1001.05	208.14	196.35	307.08	871.26	197.04
CO_2 gram	843.6	1550.3	4111.7	744.1	739.0	1472.5	3698.6	704.5
NOX, gram	4.43	10.56	27.12	4.59	4.30	12.65	24.85	4.28
FUEL, kg	.421	0.746	1.832	0.363	0.354	0.647	1.630	0.340
KW-HR	0.61	1.44	4.89	0.63	0.62	1.46	4.89	0.63

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 14-2= 743 mm Hg Test 14-4 = 740 mm Hg.

TABLE C-1 (Cont'd.) ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

ENGINE DESCRIPTION

Engine: 1972 Ford 361 CID
Carburetor: Holley 2-barrel No. D3HF-9510-CA
Distributor: No. C8TF 12102 A 961
Rated Power: 153 hp @ 3600 rpm
Maximum Torque: 278 ft. lbs @ 2400 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	278 @ 2400	282 @ 2100
Max. Engine Power, HP @ RPM	153 @ 3600	156 @ 3400
Cylinder Compression, psi min.-max. (avg.)		80 - 120 (109)
Idle RPM	550	550
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - 76 Baro. - 29.25

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	241	2100	282	3100	252	4100	
-		1200	249	2200	281	3200	248	4200	
-		1300	255	2300	280	3300	246	4300	
400	148	1400	262	2400	278	3400	241	4400	
500	187	1500	267	2500	277	3500	220	4500	
600	213	1600	272	2600	274	3600	166	4600	
700	225	1700	276	2700	271	3700	27	4700	
800	231	1800	277	2800	267	3800	0	4800	
900	232	1900	279	2900	262	3900		4900	
1000	236	2000	282	3000	257	4000		5000	

TABLE C-1 (Cont'd.) ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 14-1									
1	Idle	0	0.232	17.15	184.64	1195.7	0.56	0.526	0.00
2	25%	98	0.077	7.66	57.52	1847.8	14.06	0.716	1.58
3	55%	207	0.147	23.14	109.37	5628.7	92.62	2.067	6.46
4	25%	96	0.077	5.86	58.26	1820.2	14.66	0.699	1.56
5	10%	45	0.057	2.42	14.04	723.7	3.51	0.401	0.54
6	25%	100	0.077	6.51	62.18	2037.0	17.23	0.727	1.64
7	90%	338	0.113	52.79	1954.54	5607.1	12.55	2.896	8.17
8	25%	92	0.077	5.75	58.12	1897.3	15.52	0.695	1.51
9	CT	0	0.143	113.84	27.44	627.5	0.14	0.363	0.00
Test 14-3									
1	Idle	0	0.232	23.11	240.79	833.0	0.45	0.474	0.00
2	25%	95	0.077	6.25	56.41	1823.14	13.49	0.681	1.53
3	55%	210	0.147	24.86	124.73	5663.15	106.14	2.040	6.51
4	25%	95	0.077	5.91	62.21	1822.5	15.10	0.681	1.54
5	10%	34	0.057	3.16	16.51	971.3	3.80	0.367	0.40
6	25%	100	0.077	6.54	63.30	1880.5	16.50	0.699	1.63
7	90%	339	0.113	53.02	1925.89	5358.0	18.32	2.819	8.12
8	25%	88	0.077	6.37	66.79	1944.9	17.32	0.681	1.43
9	CT	0	0.143	84.44	23.75	484.6	0.14	0.292	0.00

IDLE RESULTS[e]

	Bagged Undiluted		Calc. from Bagged Dilute
Test 14-5C			
HC, ppm	--		13460
CO, %	--		4.5
CO_2, %	10.92		--
FUEL, kg/hr	1.9	D.R.[f]	136
Test 14-6			
HC, ppm	--		10620
CO, %	--		4.5
CO_2, %	10.60		--
FUEL, kg/hr	1.8	D.R.[f]	118

[d] Barometric Pressure: Test 14-1 = 744 mm Hg Test 14-3 = 741 mm Hg
[e] Idle Speed: Test 14-5C = 550 rpm Test 14-6 = 550 rpm
[f] Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-1 (Cont'd.) ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

TRANSIENT CYCLE

		TEST 14-6			TEST			Average
		Cold	Hot	Composite	Cold	Hot	Composite	
HC,	g/kW-hr	19.07	13.85	14.60				
CO,	g/kW-hr	243.81	223.17	226.12				
CO_2,	g/kW-hr	913	947	942				
NOX,	g/kW-hr	5.26	6.06	5.95				
SFC,	kg/kW-hr	0.428	0.423	0.424				
WORK,	kW-hr	7.71	7.65	7.66				
POWER,	kW	23.79	23.60	23.63				

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 14-6	Speed	Torque	Power	Speed	Torque	Power
Standard Error	32.	10.%	7.%	32.	10.%	5.%
Slope	1.006	.979	1.012	1.004	.953	1.003
Corr. Coef.	.9986	.9202	.9684	.9987	.9240	.9781
Intercept	4.	5.9	1.3	7.	3.5	.3
Points Used	1144	1084	1084	1144	1116	1116
kW-hr Dev. [g]		1.7			1.0	

TRANSIENT CYCLE MODAL RESULTS [h]

	Cold Cycle				Hot Cycle			
Test 14-6	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	45.63	46.61	37.07	17.65	25.26	30.05	35.61	15.05
CO, gram	227.67	415.19	1035.14	200.55	191.64	315.24	1000.27	200.36
CO_2, gram	804.3	1494.8	4018.0	716.5	792.5	156.51	4144.8	743.7
NOX, gram	4.12	10.09	22.52	3.82	3.29	13.03	25.26	3.82
FUEL, kg	0.412	0.724	1.816	0.343	0.370	0.680	1.838	0.349
KW-HR	0.62	1.49	4.96	0.63	0.65	1.47	4.94	0.59

[g] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[h] Barometric Pressure: Test 14-6 = 741 mm Hg.

TABLE C-1 (Cont'd.) ENGINE 14 SUMMARY OF RESULTS
1971 Ford 361

NINE-MODE MODAL RESULTS[i]

Test	14-4	Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
1	Idle	0	0.232	16.20	249.89	947.4	0.33	0.432	0.00
2	25%	95	0.077	6.27	59.18	1917.7	13.84	0.664	1.54
3	55%	210	0.147	24.20	120.09	5616.8	101.25	2.020	6.51
4	25%	95	0.077	6.16	63.05	1901.7	15.79	0.664	1.53
5	10%	38	0.057	3.76	18.28	1047.3	3.87	0.362	0.45
6	25%	95	0.077	6.17	64.95	1887.5	15.63	0.664	1.54
7	90%	343	0.113	53.78	1925.94	5108.9	18.32	2.747	8.24
8	25%	95	0.077	6.27	64.99	1872.0	17.21	0.671	1.54
9	CT	0	0.143	122.57	17.57	786.6	0.27	0.454	0.00

Test	
1	Idle
2	25%
3	55%
4	25%
5	10%
6	25%
7	90%
8	25%
9	CT

[i] Barometric Pressure: Test 14-4 = 739 mm Hg

TABLE C-2. ENGINE 15 SUMMARY OF RESULTS
1972 Dodge 413

TRANSIENT CYCLE

		TEST 15-1			TEST 15-2			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	15.05	10.01	10.73	12.79	7.58	8.32	9.53
CO,	g/kW-hr	232.2	209.0	211.3	231.5	208.5	211.8	211.6
CO_2,	g/kW-hr	1009.	959.	966.	1029.	993.	998.	982.
NOX,	g/kW-hr	6.13	7.67	7.45	6.11	6.99	6.86	7.16
SFC,	kg/kW-hr	0.448	0.416	0.421	0.442	0.424	0.428	0.424
WORK,	kW-hr	8.80	8.74	8.75	8.76	8.68	8.69	8.72
POWER,	kW	27.1	27.0	27.1	27.0	26.8	26.9	27.0

NINE MODE

		Test 15-2	Test 15-3	Average
HC,	g/kW-hr	10.70	10.77	10.74
CO,	g/kW-hr	74.5	66.5	70.5
CO_2,	g/kW-hr	1140.	1124.	1132.
NOX,	g/kW-hr	9.16	9.36	9.26
SFC,	kg/kW-hr	0.424	0.422	0.423
POWER,	kW	23.1	23.2	23.2

IDLE[a]

		Test 15-4	Test 15-5	Average
RPM		700	700	700
HC,	ppmC	11600	12350	12000
CO,	%	8.5	8.5	8.5
CO_2,	%	8.4	8.6	8.5
Fuel,	kg/hr	2.9	3.1	3.0

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	9.53	(7.11)	HC	22.48	7.98
CO,	g/kW-hr (g/hp-hr)	211.6	(157.8)	CO	499.1	177.3
NOX,	g/kW-hr (g/hp-hr)	7.16	(5.34)	NOX	16.89	6.00
SFC,	kg/kW-hr (lb/hp-hr)	0.424	(0.697)	FUEL CONS.	-	355.
WORK,	kW-hr (hp-hr)	8.72	(11.69)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-2 (Cont'd). ENGINE 15 SUMMARY OF RESULTS
1972 Dodge 413

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 15-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	32.	8.%	6.%	36.	6.%	4.%
Slope	1.003	0.972	0.988	1.003	0.973	0.992
Corr. Coef.	.9987	.9509	.9727	.9983	.9700	.9810
Intercept	18.	2.1	0.8	22.	-.2	-.2
Points Used	1144	1104	1104	1144	1143	1143
kW-hr Dev.[b]	----------	-1.3%	----------	----------	-1.9%	----------
TEST 15-2						
Standard Error	36.	10.%	6.%	34.	11.%	5.%
Slope	0.997	0.947	0.989	.997	.895	.975
Corr. Coef.	.9983	.9168	.9670	.9985	.9021	.9688
Intercept	11.	4.5	.5	15.	6.7	.1
Points Used	1144	1107	1107	1144	1144	1144
kW-hr Dev.[b]	----------	-1.8%	----------	----------	-2.6%	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 15-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	50.81	28.36	31.32	21.85	18.08	20.65	29.46	19.33
CO, gram	339.45	366.34	1086.05	249.99	222.19	265.38	1072.61	266.54
CO_2, gram	1051.5	1924.7	5006.0	891.6	869.0	1742.4	4921.1	854.3
NOX, gram	3.29	12.97	33.59	4.10	5.60	16.50	39.77	5.21
FUEL, kg	0.550	0.817	2.147	0.427	0.402	0.701	2.112	0.421
KW-HR	0.73	1.71	5.63	0.72	0.72	1.68	5.62	0.72
TEST 15-2								
HC, gram	48.67	23.46	27.97	11.87	9.77	16.12	27.57	12.38
CO, gram	343.67	381.82	1085.22	216.63	216.60	258.78	1101.43	233.74
CO_2, gram	1070.8	1953.1	5107.4	875.8	899.5	1879.0	4933.2	912.4
NOX, gram	3.61	12.26	33.22	4.41	4.88	15.79	35.17	4.81
FUEL, kg	0.556	0.828	2.176	0.395	0.401	0.737	2.128	0.416
KW-HR	0.73	1.71	5.63	0.68	0.71	1.67	5.62	0.68

[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c] Barometric Pressure: Test 15-1 = 740 mm Hg Test 15-2 = 738 mm Hg.

TABLE C-2 (Cont'd). ENGINE 15 SUMMARY OF RESULTS
1972 Dodge 413

ENGINE DESCRIPTION

Engine: 1972 Dodge 413
Carburetor: Holley 4-bore No. 3698395
Distributor: No. 3656839 (Electronic Ignition)
Rated Power : 238 hp at 3600 rpm
Maximum Torque : 407 ft-lb at 2000 rpm
Comments:

ENGINE TUNE-UP DATA

	Mfg. Spec.	Measured
Total Advance, Deg. @ RPM & In. Hg.	--	--
Mech. Advance, Deg. @ RPM	13.5 @ 1900	13.5 @ 1900
Vac. Advance, Deg. @ In. Hg.	9.5 @ 13.5	9.5 @ 13.5
Max. Engine Torque, Ft-Lb @ RPM	N.A.	300 @ 2400
Max. Engine Power, HP @ RPM	N.A.	164 @ 3600
Cylinder Compression, psi min.-max.(avg.)	100-140	100-110 (105)
Idle RPM	700	700

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING @ Temp - 84°F Baro - 29.10"Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	--	1100	279	2100	294	3100	276	4100	199
-	--	1200	289	2200	297	3200	268	4200	192
-	--	1300	295	2300	298	3300	259	4300	
400	--	1400	292	2400	300	3400	253	4400	
500	200	1500	292	2500	299	3500	245	4500	
600	215	1600	293	2600	297	3600	239	4600	
700	238	1700	291	2700	295	3700	231	4700	
800	243	1800	292	2800	292	3800	224	4800	
900	255	1900	292	2900	289	3900	215	4900	
1000	269	2000	292	3000	283	4000	207	5000	

VEHICLE DESCRIPTION

1973 Concorde M30 Motor Home
Serial Number: M39CN3S060736
Transmission: Automatic GVW: 11,000 lbs

TABLE C-2 (Cont'd). ENGINE 15 SUMMARY OF RESULTS
1972 Dodge 413

NINE-MODE MODAL RESULTS [d]

		Torque	Weighting	Weighted Emissions, grams/hour				Weighted Fuel & Power	
Test 15-2		N.m	Factor	HC	CO	CO_2	NO_x	kg/hr	kW
1	Idle	0	0.232	43.57	646.95	1173.5	0.00	0.758	0.000
2	25%	102	0.077	1.79	39.25	2356.1	8.46	0.803	1.644
3	55%	228	0.147	12.98	185.22	6671.1	72.13	2.327	7.076
4	25%	102	0.077	1.67	42.99	2374.6	8.94	0.800	1.653
5	10%	41	0.057	0.75	34.34	1336.7	2.16	0.543	0.488
6	25%	106	0.077	2.00	48.81	2421.0	9.86	0.810	1.725
7	90%	369	0.113	21.91	454.7	7180.7	100.82	2.553	8.850
8	25%	100	0.077	1.89	55.06	2316.7	8.65	0.793	1.630
9	CT	0	0.143	160.40	209.97	465.7	0.14	0.487	0.000
Test 15-3									
1	Idle	0	0.232	46.41	618.10	1081.0	0.33	0.737	0.000
2	25%	106	0.077	1.19	35.24	2368.0	9.30	0.814	1.705
3	55%	228	0.147	11.43	161.28	6533.7	71.41	2.300	7.059
4	25%	102	0.077	1.57	40.57	2359.9	9.57	0.796	1.655
5	10%	36	0.057	0.75	25.68	1299.7	2.15	0.445	0.423
6	25%	106	0.077	1.57	34.51	2419.2	10.49	0.821	1.717
7	90%	370	0.113	19.91	361.70	7148.8	103.65	2.563	8.927
8	25%	102	0.077	1.79	42.13	2375.5	9.51	0.803	1.661
9	CT	0	0.143	164.74	220.52	437.6	0.14	0.480	0.000

TWO-SPEED IDLE RESULTS [e]

	Garage-Type Analyzer (ppmH)		Bagged Undiluted		Calc. from Bagged Dilute	
Test 15-4	Low	High	Low	High	Low	High
HC, ppm	--		--		11600	
CO, %	8.2		--		8.5	
CO_2, %	--		8.4		--	
NOX, ppm	--		20		--	
FUEL, kg/hr	2.9		--	D.R. [f]	93	
Test 15-5						
HC, ppm	--		--		12350	
CO, %	8.1		--		8.5	
CO_2, %	--		8.6		--	
NOX, ppm	--		--		--	
FUEL, kg/hr	3.1		--	D.R. [g]	90	

[d] Barometric Pressure: Test 15-2 = 738.4 mm Hg Test 15-3 = 742.4 mm Hg

[e] Low Idle = 700 RPM High Idle = 2500 RPM

[f] Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-3. ENGINE 16 SUMMARY OF RESULTS
1973 Chevrolet 454

TRANSIENT CYCLE

		Test 16-1			Test 16-2			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	4.65	3.98	4.08	4.41	3.63	3.74	3.91
CO,	g/kW-hr	111.30	102.53	103.78	106.85	95.51	97.13	100.46
CO_2,	g/kW-hr	1227.	1142.	1154.	1222.	1155.	1165.	1160.
NOX,	g/kW-hr	6.08	6.13	6.12	6.17	6.15	6.15	6.14
SFC,	kg/kW-hr	0.447	0.415	0.420	0.443	0.415	0.419	0.420
WORK,	kW-hr	8.89	8.95	8.94	8.87	8.87	8.87	8.91
POWER,	kW	27.4	27.6	27.6	27.4	27.4	27.4	27.5

NINE MODE

	Test 16-1	Test 16-3	Average
HC, g/kW-hr	6.26	7.15	6.71
CO, g/kW-hr	32.81	29.68	31.25
CO_2, g/kW-hr	1299.3	1284.9	1292.1
NOX, g/kW-hr	5.82	6.21	6.02
SFC, kg/kW-hr	0.455	0.467	0.461
POWER, kW	22.0	22.0	22.0

IDLE

	Test 16-1	Test 16-2	Average
RPM	700	700	700
HC, ppmC	4459	5734	5097
CO, %	1.03	0.79	0.91
CO_2, %	13.65	13.10	13.38
Fuel, kg/hr	2.7	2.7	2.7

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	3.91 (2.92)	HC	9.31	3.35
CO,	g/kW-hr (g/hp-hr)	100.46 (74.91)	CO	239.19	85.98
NOX,	g/kW-hr (g/hp-hr)	6.14 (4.58)	NOX	14.62	5.26
SFC,	kg/kW-hr(lb/hp-hr)	0.420 (0.691)	FUEL CONS.	--	359.
WORK,	kW-hr (hp-hr)	8.91 (11.95)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-3 (Cont'd). ENGINE 16 SUMMARY OF RESULTS
1973 Chevrolet 454

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 16-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	54.	7.%	4.%	55.	5.%	3.%
Slope	.999	.935	.983	.998	.973	.994
Corr. Coef.	.9968	.9426	.9742	.9968	.9769	.9854
Intercept	-5.	6.8	.7	0.	2.7	.2
Points Used	1144	1089	1089	1144	1112	1112
kW-hr Dev.[b]	----------	-8.9	----------	----------	-8.3	----------
TEST 16-2						
Standard Error	52.	8.%	4.%	52.	5.%	3.%
Slope	1.001	.919	.983	1.001	.957	.995
Corr. Coef.	.9971	.9305	.973	.9971	.9695	.9832
Intercept	-7.	8.0	.8	-3.	4.6	.3
Points Used	1144	1083	1083	1144	1108	1108
kW-hr Dev.[b]	----------	-9.0	----------	----------	-9.0	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 16-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	12.87	5.89	18.80	3.76	7.18	5.31	18.77	4.31
CO, gram	129.04	73.26	730.74	55.89	42.90	61.16	754.87	58.22
CO_2, gram	1378.4	2498.4	5834.9	1188.6	1121.6	2348.6	5568.7	1175.1
NOX, gram	2.89	11.43	35.80	3.90	3.94	11.84	35.18	3.92
FUEL, kg	0.511	0.830	2.220	0.406	0.382	0.776	2.148	0.404
KW-HR	0.67	1.69	5.86	0.66	0.68	1.70	5.88	0.68
TEST 16-2								
HC, gram	11.86	5.83	17.98	3.41	6.17	5.00	17.67	3.39
CO, gram	138.02	62.27	704.01	43.48	35.75	50.92	715.43	45.11
CO_2, gram	1363.9	2528.5	5722.2	1224.6	1147.6	2373.1	5561.8	1164.6
NOX, gram	2.78	12.02	36.19	3.75	3.77	11.61	35.31	3.90
FUEL, kg	0.510	0.834	2.171	0.411	0.386	0.778	2.125	0.393
KW-HR	0.66	1.71	5.84	0.66	0.66	1.71	5.84	0.66

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 16-1 = 747 mm Hg Test 16-2 = 751 mm Hg.

TABLE C-3 (Cont'd). ENGINE 16 SUMMARY OF RESULTS
1973 Chevrolet 454

ENGINE DESCRIPTION

Engine: 1973 Chevrolet 454 Serial No. TO 608 TRC
Carburetor: Rochester Quadra Jet 4-barrel No. 7043507QB
Distributor: No. 1112113
Rated Power: 240 hp @ 4000 rpm
Maximum Torque: 355 ft-lb @ 2800 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	303 @ 2800
Max. Engine Power, HP @ RPM	N.A.	210 @ 3900
Cylinder Compression, psi min.-max. (avg.)	105-150	120-135 (125)
Idle RPM	700	700

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 73°F Baro. - 29.29 "Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	256	2100	284	3100	300	4100	265
-	-	1200	270	2200	283	3200	300	4200	258
-	-	1300	281	2300	283	3300	300	4300	248
400	-	1400	282	2400	289	3400	299	4400	237
500	-	1500	280	2500	293	3500	296	4500	-
600	-	1600	279	2600	297	3600	295	4600	-
700	-	1700	271	2700	298	3700	289	4700	-
800	285	1800	268	2800	303	3800	286	4800	-
900	265	1900	272	2900	302	3900	283	4900	-
1000	249	2000	278	3000	300	4000	274	5000	-

VEHICLE DESCRIPTION

1973 Chevalier 18-foot Step-Van
Transmission: Automatic GVW: 11,800 lbs

TABLE C-3 (Cont'd). ENGINE 16 SUMMARY OF RESULTS
1973 Chevrolet 454

NINE-MODE MODAL RESULTS[d]

		Torque	Weighting	Weighted Emissions, grams/hour				Weighted Fuel & Power	
Test 16-1		N.m	Factor	HC	CO	CO_2	NO_x	kg/hr	kW
1	Idle	0	0.232	11.39	88.48	1561.3	0.61	0.610	0.00
2	25%	98	0.077	0.28	5.74	2658.0	5.27	0.880	1.57
3	55%	220	0.147	1.43	23.69	7424.3	40.40	2.427	6.76
4	25%	95	0.077	0.26	5.03	2606.0	5.41	0.866	1.53
5	10%	41	0.057	0.08	2.41	1565.9	1.86	0.525	0.48
6	25%	100	0.077	0.23	5.11	2664.8	5.72	0.891	1.62
7	90%	359	0.113	24.15	509.64	7043.5	63.19	2.578	8.50
8	25%	98	0.077	0.25	5.35	2588.5	5.64	0.866	1.57
9	CT	0	0.143	99.91	77.77	528.7	0.19	0.383	0.00
Test 16-3									
1	Idle	0	0.232	16.93	92.54	1549.9	0.31	0.631	0.00
2	25%	100	0.077	0.31	5.53	2631.0	7.16	0.873	1.62
3	55%	217	0.147	1.09	20.34	7190.6	37.89	2.401	6.68
4	25%	96	0.077	0.19	4.79	2622.6	6.92	0.873	1.55
5	10%	38	0.057	0.08	2.11	1491.7	1.68	0.517	0.46
6	25%	100	0.077	0.19	4.93	2653.5	5.74	0.891	1.62
7	90%	359	0.113	25.24	416.44	6972.7	69.47	2.589	8.50
8	25%	98	0.077	0.21	5.01	2591.5	7.02	0.873	1.57
9	CT	0	0.143	113.07	101.06	562.8	0.36	0.631	0.00

IDLE RESULTS[e]

	Bagged Undiluted	Calc. from Bagged Dilute
Test 16-1		
HC, ppm	--	4459.
CO, %	--	1.03
CO_2, %	13.65	--
	FUEL 2.7 kg/hr	D.R.[f] 91
Test 16-2		
HC, ppm	--	5734.
CO, %	--	0.79
CO_2, %	13.10	--
	FUEL 2.7 kg/hr	D.R.[f] 94

[d]Barometric Pressure: Test 16-1 = 749.3 mm Hg Test 16-3 = 752.1 mm Hg
[e]Idle Speed: Test 16-1 700 rpm Test 16-2 700 rpm
[f]Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-4. ENGINE 17 SUMMARY OF RESULTS
1973 GMC 427

TRANSIENT CYCLE

	Test 17-2			Test 17-3			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	10.09	7.33	7.72	10.03	8.00	8.29	8.01
CO, g/kW-hr	85.12	65.45	68.26	85.05	65.05	67.91	68.09
CO_2, g/kW-hr	1066.	1038.	1042.	1052.	1031.	1034.	1038.
NOX, g/kW-hr	10.05	10.41	10.36	10.63	11.46	11.34	10.85
SFC, kg/kW-hr	0.388	0.367	0.370	0.384	0.365	0.368	0.369
WORK, kW-hr	9.13	9.19	9.18	9.30	9.25	9.26	9.22
POWER, kW	28.2	28.4	28.3	28.7	28.5	28.6	28.4
Methane, g/kW-hr	0.69	0.47	0.50	0.59	0.49	0.50	0.50

NINE MODE

	Test 17-1	Test 17-2	Average
HC, g/kW-hr	11.13	10.08	10.61
CO, g/kW-hr	43.84	49.35	46.60
CO_2, g/kW-hr	1038.	1081.	1060.
NOX, g/kW-hr	9.87	9.62	9.75
SFC, kg/kW-hr	0.383	0.391	0.387
POWER, kW	25.5	25.6	25.6

IDLE

	Test 17-1	Test 17-2	Average
RPM	530	530	530
HC, ppmC	8175	7210	7690
CO, %	2.9	2.6	2.7
CO_2, %	11.2	11.3	11.3
Fuel, kg/hr	2.2	2.3	2.2

TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	8.01	(5.97)	HC	21.71	7.09
CO,	g/kW-hr (g/hp-hr)	68.09	(50.78)	CO	184.53	60.30
NOX,	g/kW-hr (g/hp-hr)	10.85	(8.09)	NOX	29.40	9.61
Methane,	g/kW-hr (g/hp-hr)	0.50	(0.37)	Methane	1.36	0.44
SFC,	kg/kW-hr (lb/hp-hr)	0.369	(0.607)	FUEL CONS.	--	327.
WORK,	kW-hr (hp-hr)	9.22	(12.36)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-4 (Cont'd). ENGINE 17 SUMMARY OF RESULTS
1973 GMC 427

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 17-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	66.	10.%	5.%	67.	6.%	4.%
Slope	.987	.940	.974	.988	.966	.979
Corr. Coef.	.9954	.9157	.9624	.9952	.9698	.9793
Intercept	35.	-.8	-.2	39.	-1.1	-.1
Points Used	1144	1139	1139	1144	1144	1144
kW-hr Dev.[b]		-6.3			-5.8	
TEST 17-3						
Standard Error	68.	9.%	5.%	67.	6.%	3.%
Slope	.985	.956	.977	.988	.985	.996
Corr. Coef.	.9951	.9397	.9700	.9953	.9689	.9795
Intercept	36.	-.0	.5	.37	-2.2	-.5
Points Used	1144	1134	1134	1144	1142	1142
kW-hr Dev.[b]		-4.7			-5.1	

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 17-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	35.09	19.58	28.34	9.11	14.29	15.18	25.08	12.80
CO, gram	196.40	142.54	374.85	63.67	78.18	95.41	336.35	91.31
CO_2, gram	1086.5	2188.4	5448.2	1012.8	1018.5	2125.4	5379.6	1009.4
NOX, gram	4.75	15.65	65.74	5.62	5.64	17.22	67.11	5.67
FUEL, kg	.475	.780	1.932	.360	.374	.732	1.888	.376
KW-HR	.74	1.80	5.85	.74	.77	1.82	5.83	.77
TEST 17-3								
HC, gram	33.91	19.81	26.66	12.90	17.03	18.15	25.93	12.90
CO, gram	188.93	136.91	373.84	91.15	80.37	102.69	337.87	81.05
CO_2, gram	1092.8	2170.6	5508.0	1011.3	1013.7	2129.5	5433.3	963.6
NOX, gram	5.02	17.74	70.35	5.71	5.84	18.12	76.43	5.66
FUEL, kg	.472	.772	1.948	.377	.376	.740	1.906	.357
KW-HR	.75	1.83	5.93	.79	.75	1.83	5.89	.78

[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c] Barometric Pressure: Test 17-2 = 744 mm Hg Test 17-3 = 744 mm Hg.

TABLE C-4 (Cont'd) ENGINE 17 SUMMARY OF RESULTS
1973 GMC 427

ENGINE DESCRIPTION

Engine: 1973 GMC 427 Serial Number T1113AHT
Carburetor: Holley 4-bore No. 1111365
Distributor: No. 1111365
Rated Power: 230 hp at 4000 rpm
Maximum Torque: 360 ft-lb at 2800 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	320@2800
Max. Engine Power, HP @ RPM	N.A.	203@3800
Cylinder Compression, psi min.-max. (avg.)	Low 80% of High	100-125(110)
Idle RPM	550	550

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 89 Baro. - 29.14

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	285	2100	327	3100	311	4100	-
-	-	1200	294	2200	327	3200	309	4200	-
-	-	1300	300	2300	327	3300	305	4300	-
400	150	1400	303	2400	326	3400	301	4400	-
500	220	1500	309	2500	327	3500	300	4500	-
600	259	1600	315	2600	322	3600	295	4600	-
700	254	1700	318	2700	319	3700	289	4700	-
800	264	1800	323	2800	317	3800	283	4800	-
900	273	1900	323	2900	315	3900	275	4900	-
1000	278	2000	325	3000	312	4000	267	5000	-

VEHICLE DESCRIPTION

1973 GMC Tractor
Model Number: CE 66213
Transmission: Automatic GVW: 31,500 lbs

TABLE C-4 (Cont'd). ENGINE 17 SUMMARY OF RESULTS
1973 GMC 427

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 17-1									
1	Idle	0	0.232	37.33	99.14	1076.3	0.22	0.474	0.00
2	25%	118	0.077	6.42	78.74	2440.1	9.43	0.856	1.90
3	55%	251	0.147	23.69	266.70	6647.8	70.35	2.521	7.74
4	25%	113	0.077	8.38	124.62	2364.3	9.03	0.838	1.81
5	10%	45	0.057	1.94	42.70	1276.9	1.98	0.465	0.54
6	25%	119	0.077	7.64	118.69	2055.5	8.70	0.870	1.92
7	90%	407	0.113	30.10	219.14	8054.5	142.4	2.763	9.75
8	25%	117	0.077	8.88	136.06	2377.7	9.75	0.866	1.88
9	CT	0	0.143	159.90	33.77	225.0	0.14	0.331	0.00
Test 17-2									
1	Idle	0	0.232	35.39	92.99	1174.8	0.22	0.463	0.00
2	25%	121	0.077	5.61	79.54	2499.0	9.53	0.873	1.95
3	55%	252	0.147	24.73	284.92	7243.7	74.56	2.534	7.79
4	25%	113	0.077	7.02	109.34	2364.9	8.48	0.849	1.81
5	10%	46	0.057	1.61	37.22	1380.7	2.22	0.476	0.55
6	25%	114	0.077	7.13	103.75	2422.9	9.47	0.852	1.83
7	90%	414	0.113	32.48	273.23	8019.7	132.66	2.794	9.83
8	25%	117	0.077	8.95	139.43	2406.6	9.37	0.873	1.88
9	CT	0	0.143	135.53	145.28	218.3	0.21	0.324	0.00

IDLE RESULTS[e]

	Bagged Undiluted	Calc. from Bagged Dilute
Test 17-1		
HC, ppm	--	8175.
CO, %	--	2.9
CO_2, %	11.2	--
	FUEL 2.2 kg/hr	D.R.[f] 102
Test 17-2		
HC, ppm	--	7210.
CO, %	--	2.6
CO_2, %	11.3	--
	FUEL 2.3kg/hr	D.R.[f] 103

[d]Barometric Pressure: Test 17-1 = 742.95 mm Hg Test 17-2 = 742.70 mm Hg
[e]Idle Speed: Test 17-1 = 530 rpm Test 17-2 = 530 rpm
[f]Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-5. ENGINE 18 SUMMARY OF RESULTS
1972 Chevrolet 350

TRANSIENT CYCLE

	Test 18-1			Test 18-3			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	8.74	4.80	5.36	7.35	4.50	4.91	5.14
CO, g/kW-hr	96.70	109.38	107.57	125.35	105.64	108.46	108.02
CO_2, g/kW-hr	964.	883.	895.	902.	907.	906.	901.
NOX, g/kW-hr	8.36	8.26	8.27	8.60	8.51	8.52	8.40
SFC, kg/kW-hr	0.361	0.337	0.340	0.354	0.343	0.345	0.343
WORK, kW-hr	8.00	8.10	8.09	7.85	7.89	7.88	7.99
POWER, kW	24.7	25.0	25.0	24.2	24.3	24.3	24.7
Methane, g/kW-hr	0.48	0.35	0.37	--	--	--	0.37

NINE MODE

	Test 18-2	Test 18-4	Average
HC, g/kW-hr	8.72	9.29	9.01
CO, g/kW-hr	41.01	47.31	44.16
CO_2, g/kW-hr	1000.49	1007.40	1003.95
NOX, g/kW-hr	9.91	9.49	9.70
SFC, kg/kW-hr	0.373	0.374	0.374
POWER, kW	20.2	19.9	20.1

IDLE

	Test 18-1	Test 18-2	Average
RPM	600	610	605
HC, ppmC	3500	4915	4210
CO, %	1.6	3.0	2.3
CO_2, %	12.5	11.9	12.2
Fuel, kg/hr	2.2	2.0	2.1

TRANSIENT CYCLE AVERAGE VALUES

		g/kg Fuel	g/km[a]
HC, g/kW-hr (g/hp-hr)	5.14 (3.83)	HC	14.99	3.95
CO, g/kW-hr (g/hp-hr)	108.02 (80.55)	CO	314.93	82.91
NOX, g/kW-hr (g/hp-hr)	8.40 (6.26)	NOX	24.49	6.45
Methane, g/kW-hr (g/hp-hr)	0.37 (0.28)	Methane	1.08	0.28
SFC, kg/kW-hr(lb/hp-hr)	0.343 (0.564)	FUEL CONS.	--	263.
WORK, kW-hr (hp-hr)	7.99 (10.72)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-5 (Cont'd). ENGINE 18 SUMMARY OF RESULTS
1972 Chevrolet 350

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 18-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	64.	12.%	7.%	72.	5.%	5.%
Slope	.993	.863	.976	.992	.974	.996
Corr. Coef.	.9958	.8609	.9638	.9947	.9763	.9894
Intercept	13.	14.5	1.4	15.	4.8	.9
Points Used	1144	1137	1137	1144	1143	1143
kW-hr Dev.[b]	----------	+0.2	----------	--------	+1.5	----------
TEST 18-3						
Standard Error	70.	8.%	4.%	79.	6.%	5.%
Slope	.987	.931	.981	1.010	.975	.950
Corr. Coef.	.9949	.9372	.9837	.9953	.9635	.9789
Intercept	18.	6.2	.5	-36.	-2.8	.6
Points Used	1144	1135	1135	1144	1144	1144
kW-hr Dev.[b]	--------	-1.8	----------	-------	-1.2	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 18-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	24.97	13.98	13.27	17.70	6.46	9.22	17.79	5.41
CO, gram	231.02	176.36	262.84	103.17	91.97	172.75	514.86	106.77
CO_2, gram	789.8	1555.8	4575.9	788.9	740.6	1485.4	4236.2	694.1
NOX, gram	2.49	10.92	48.92	4.52	4.59	12.84	45.15	4.33
FUEL, kg	0.388	0.592	1.586	0.318	0.285	0.563	1.608	0.277
KW-HR	0.71	1.50	5.13	0.67	0.68	1.53	5.23	0.67
TEST 18-3								
HC, gram	21.18	14.06	17.16	5.25	5.43	7.58	16.69	5.82
CO, gram	243.61	163.76	464.82	111.56	96.25	143.97	473.95	119.62
CO_2, gram	703.7	1490.5	4165.1	716.9	736.1	1515.4	4193.7	715.8
NOX, gram	2.67	12.57	47.55	4.74	4.55	13.43	44.50	4.65
FUEL, kg	0.364	0.565	1.560	0.287	0.285	0.557	1.574	0.291
KW-HR	0.64	1.46	5.10	0.65	0.64	1.50	5.10	0.65

[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c] Barometric Pressure: Test 18-1 = 751 mm Hg Test 18-3 = 742 mm Hg.

TABLE C-5 (Cont'd). ENGINE 18 SUMMARY OF RESULTS
1972 Chevrolet 350

ENGINE DESCRIPTION

Engine: 1972 Chevrolet 350 Serial No. VO 210 TLX
Carburetor: Rochester Quadra Jet 4-barrel No. 7042208 QC 0402
Distributor: No. 1112047 2A19
Rated Power: 175 hp @ 4000 rpm
Maximum Torque: 290 ft-lb @ 2400 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	256 @ 2800
Max. Engine Power, HP @ RPM	N.A.	155 @ 3900
Cylinder Compression, psi min.-max. (avg.)	130-150	125-150 (135)
Idle RPM	600	600

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 74°F Baro. - 29.37 " Hg.

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	231	2100	236	3100	248	4100	194
-	-	1200	233	2200	242	3200	243	4200	185
-	-	1300	237	2300	247	3300	237	4300	179
400	204	1400	235	2400	250	3400	233	4400	170
500	219	1500	233	2500	253	3500	227	4500	163
600	220	1600	232	2600	255	3600	220	4600	-
700	220	1700	230	2700	255	3700	215	4700	-
800	223	1800	230	2800	256	3800	212	4800	-
900	220	1900	232	2900	254	3900	208	4900	-
1000	227	2000	234	3000	253	4000	201	5000	-

VEHICLE DESCRIPTION

1972 Chevrolet Step-Van
Model: Olson Kurbmaster
Transmission: Automatic GVW: 9,000 to 14,999 lbs.

TABLE C-5 (Cont'd). ENGINE 18 SUMMARY OF RESULTS
1972 Chevrolet 350

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 18-2									
1	Idle	0	0.232	9.49	159.02	847.73	0.53	0.421	0.00
2	25%	89	0.077	4.61	11.63	1688.06	13.66	0.583	1.45
3	55%	195	0.147	10.88	33.06	5396.96	66.12	1.834	6.07
4	25%	92	0.077	4.70	12.11	1728.06	14.60	0.587	1.49
5	10%	33	0.057	2.33	17.74	846.25	2.03	0.303	0.39
6	25%	89	0.077	4.41	11.25	1668.47	13.72	0.583	1.45
7	90%	328	0.113	25.18	506.22	5909.86	74.31	2.307	7.84
8	25%	91	0.077	4.53	13.35	1702.66	14.43	0.594	1.47
9	CT	0	0.143	109.55	61.78	371.00	0.26	0.305	0.00
Test 18-4									
1	Idle	0	0.232	8.60	131.21	856.08	0.36	0.421	0.00
2	25%	94	0.077	5.11	13.11	1673.09	14.63	0.583	1.51
3	55%	195	0.147	11.25	32.99	5446.70	67.77	1.854	6.05
4	25%	89	0.077	5.19	14.79	1708.85	14.77	0.576	1.45
5	10%	35	0.057	3.04	26.48	885.44	2.51	0.310	0.42
6	25%	94	0.077	5.09	13.36	1738.41	15.76	0.594	1.51
7	90%	319	0.113	27.57	629.55	5676.35	59.23	2.255	7.54
8	25%	86	0.077	4.79	15.79	1647.12	13.48	0.576	1.40
9	CT	0	0.143	114.13	62.96	387.99	0.14	0.259	0.00

IDLE RESULTS[e]

		Bagged Undiluted	Calc. from Bagged Dilute
Test 18-1			
HC,	ppm	--	3500.
CO,	%	--	1.6
CO_2,	%	12.47	--
		FUEL 2.3 kg/hr	D.R.[f] 128
Test 18-2			
HC,	ppm	--	4917.
CO,	%	--	3.0
CO_2,	%	11.94	--
		FUEL 2.0 kg/hr	D.R.[f] 147

[d]Barometric Pressure: Test 18-2 = 746.25 mm Hg Test 18-4 = 739.14 mm Hg
[e]Idle Speed: Test 18-1 600 rpm Test 18-2 610 rpm
[f]Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-6. ENGINE 19 SUMMARY OF RESULTS
1972 IHC 345

TRANSIENT CYCLE

	TEST 19-2			TEST 19-3			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	9.45	5.86	6.37	10.28	5.81	6.45	6.41
CO, g/kW-hr	160.94	155.28	156.09	153.54	143.78	145.17	150.63
CO_2, g/kW-hr	871	862	863	845	825	828	846
NOX, g/kW-hr	6.78	6.85	6.84	6.25	6.18	6.19	6.52
SFC, kg/kW-hr	0.364	0.354	0.355	0.353	0.337	0.339	0.347
WORK, kW-hr	8.64	8.67	8.67	8.74	8.76	8.76	8.72
POWER, kW	26.65	26.75	26.74	26.96	27.02	27.01	26.88
Methane, g/kW-hr	0.54	0.41	0.43	0.53	0.40	0.42	0.43

NINE MODE

	Test 19-1	Test 19-2	Average
HC, g/kW-hr	8.33	8.48	8.41
CO, g/kW-hr	45.58	46.08	45.83
CO_2, g/kW-hr	957.5	954.5	956.0
NOX, g/kW-hr	9.04	9.40	9.22
SFC, kg/kW-hr	0.393	0.387	0.390
POWER, kW	20.34	20.30	20.32

IDLE

	Test 19-1	Test 19-2	Average
RPM	710	710	710
HC, ppmC	2121	2071	2096
CO, %	1.3	1.5	1.4
CO_2, %	11.12	10.86	10.99
Fuel, kg/hr	2.2	2.2	2.2

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC, g/kW-hr (g/hp-hr)	6.41	(4.78)	HC	18.47	5.37
CO, g/kW-hr (g/hp-hr)	150.63	(112.32)	CO	434.09	216.18
NOX, g/kW-hr (g/hp-hr)	6.52	(4.86)	NOX	18.79	5.46
Methane g/kW-hr (g/hp-hr)	0.43	(0.32)	Methane	1.24	0.36
SFC, kg/kW-hr (lb/hp-hr)	0.347	(0.571)	FUEL CONS.	--	291.
WORK, kW-hr (hp-hr)	8.72	(11.69)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-6 (Cont'd). ENGINE 19 SUMMARY OF RESULTS
1972 IHC 345

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 19-2	Speed	Torque	Power	Speed	Torque	Power
Standard Error	44.	7.%	5.%	52.	6.%	5.%
Slope	.984	.988	1.000	.984	.973	.998
Corr. Coef.	19977	.9571	.9767	.9969	.9641	.9772
Intercept	29.	2.6	.6	35.	2.9	.5
Points Used	1144	1052	1052	1144	1079	1079
kW-hr Dev.[b]	----------	1.3	----------	----------	1.7	----------
TEST 19-3						
Standard Error	44.	7.%	5.%	47.	6.%	6.%
Slope	.990	1.000	1.010	.987	.992	1.000
Corr. Coef.	.9978	.9632	.9811	.9975	.9744	.9844
Intercept	22.	2.6	.8	31.	3.9	1.1
Points Used	1144	1134	1134	1144	1144	1144
kW-hr Dev.[b]	----------	2.4	----------	----------	2.6	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
Test 19-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	34.79	15.59	23.91	7.38	8.44	12.27	25.27	4.84
CO, gram	184.02	231.31	843.55	132.37	105.61	204.26	912.53	124.58
CO_2, gram	965.6	1669.8	4139.8	750.3	820.1	1585.6	4210.1	859.7
NOX, gram	4.23	12.32	38.14	3.95	4.26	12.77	38.25	4.15
FUEL, kg	0.430	0.657	1.747	0.309	0.319	0.613	1.805	0.338
KW-HR	0.71	1.68	5.51	0.74	0.74	1.68	5.51	0.75
TEST 19-3								
HC, gram	40.79	17.71	24.88	6.48	6.63	12.93	25.11	6.25
CO, gram	189.19	203.46	818.73	130.92	96.13	204.71	831.64	126.67
CO_2 gram	908.3	1620.7	4085.6	775.1	803.2	1578.0	4060.0	784.6
NOX, gram	3.56	11.87	35.31	3.92	3.82	11.97	34.62	3.69
FUEL, kg	0.421	0.629	1.718	0.316	0.307	0.612	1.717	0.316
KW-HR	0.71	1.70	5.61	0.73	0.71	1.71	5.61	0.74

[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c] Barometric Pressure: Test 19.2= 739 mm Hg Test 19.3 = 745 mm Hg.

TABLE C-6 (Cont'd). ENGINE 19 SUMMARY OF RESULTS
1972 IHC 345

ENGINE DESCRIPTION

Engine: 1972 International Harvester 345 Serial No. 1099236V345E
Carburetor: Holley 2-bore No. 454578-C91
Distributor: No. 433142
Rated Power: 197 hp @ 4000 rpm
Maximum Torque: 309 ft-lb. @ 2200 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	279 @ 2200
Max. Engine Power, HP @ RPM	N.A.	152 @ 4000
Cylinder Compression, psi min.-max. (avg.)	80% of High	115 - 125(120)
Idle RPM	700	700

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 81°F Baro. - 29.39"Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	249	2100	281	3100	253	4100	195
-		1200	258	2200	279	3200	248	4200	190
-		1300	264	2300	278	3300	244	4300	-
-		1400	268	2400	274	3400	236	4400	-
500	210	1500	271	2500	272	3500	231	4500	-
600	211	1600	275	2600	269	3600	226	4600	-
700	210	1700	278	2700	268	3700	220	4700	-
800	208	1800	281	2800	265	3800	214	4800	-
900	227	1900	282	2900	262	3900	206	4900	-
1000	241	2000	282	3000	258	4000	200	5000	-

VEHICLE DESCRIPTION

1972 IHC Load Star 1600 Truck
Transmission: Manual GVW:

TABLE C-6 (Cont'd). ENGINE 19 SUMMARY OF RESULTS
1972 IHC 345

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 19-1									
1	Idle	0	0.232	7.38	107.84	1110.3	0.53	0.600	0.00
2	25%	92	0.077	5.54	18.67	1680.2	12.16	0.611	1.48
3	55%	201	0.147	21.38	108.50	5037.5	75.94	1.920	6.17
4	25%	91	0.077	5.05	18.33	1643.1	11.89	0.639	1.46
5	10%	39	0.057	1.89	10.75	914.0	2.52	0.349	0.47
6	25%	92	0.077	5.43	17.55	1642.2	12.49	0.629	1.48
7	90%	329	0.113	28.96	589.39	5353.6	55.77	2.281	7.80
8	25%	92	0.077	5.42	19.85	1634.3	12.41	0.629	1.48
9	CT	0	0.143	88.41	28.18	475.7	0.24	0.350	0.00
Test 19-2									
1	Idle	0	0.232	6.79	100.50	1089.9	0.42	0.558	0.00
2	25%	94	0.077	5.63	18.29	1699.9	13.60	0.625	1.51
3	55%	201	0.147	20.94	113.20	5044.2	77.58	1.894	6.17
4	25%	92	0.077	5.20	19.66	1623.0	12.74	0.622	1.48
5	10%	35	0.057	1.73	11.38	889.9	2.31	0.336	0.42
6	25%	92	0.077	5.64	19.31	1648.8	13.88	0.611	1.48
7	90%	328	0.113	29.53	600.0	5303.9	57.18	2.271	7.76
8	25%	92	0.077	5.65	22.96	1624.0	12.94	0.629	1.48
9	CT	0	0.143	90.97	30.63	466.1	0.07	0.324	0.00

IDLE RESULTS[e]

		Bagged Undiluted	Calc. from Bagged Dilute
Test 19-1			
HC,	ppm	-	2121
CO,	%	-	1.3
CO_2,	%	11.12	-
		FUEL 2.2 kg/hr	D.R.[f] 101
Test 19-2			
HC,	ppm	-	2071
CO,	%	-	1.5
CO_2,	%	10.86	-
		FUEL 2.2 kg/hr	D.R.[f] 109

[d] Barometric Pressure: Test 19-1 = 746 mm Hg Test 19-2 = 744 mm Hg

[e] Idle Speed: Test 19-1 = 705rpm Test 19-2 = 710 rpm

[f] Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted

TABLE C-7. ENGINE 20 SUMMARY OF RESULTS
1972 Ford 300

TRANSIENT CYCLE

	Test 20-3			Test 20-4			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	14.18	9.26	9.96	14.89	9.48	10.25	10.11
CO, g/kW-hr	108.85	92.71	95.02	110.08	93.14	95.56	95.29
CO_2, g/kW-hr	938	926	928	950	940	941	935
NOX, g/kW-hr	10.14	11.12	10.98	10.98	12.44	12.23	11.61
SFC, kg/kW-hr	0.364	0.347	0.349	0.369	0.352	0.354	0.352
WORK, kW-hr	6.35	6.30	6.31	6.25	6.27	6.27	6.29
POWER, kW	19.59	19.44	19.46	19.28	19.34	19.33	19.40
Methane, g/kW-hr	0.57	0.35	0.38	0.57	0.38	0.41	0.40

NINE MODE

	Test 20-3	Test 20-4	Average
HC, g/kW-hr	9.47	10.25	9.86
CO, g/kW-hr	44.21	42.66	43.44
CO_2, g/kW-hr	1034.98	1025.61	1030.30
NOX, g/kW-hr	11.45	11.95	11.70
SFC, kg/kW-hr	0.372	0.376	0.374
POWER, kW	16.58	16.79	16.69

IDLE

	Test 20-3	Test 20-4	Average
RPM	600	600	600
HC, ppmC	18020	17730	17875
CO, %	3.88	3.85	3.87
CO_2, %	9.16	9.16	9.16
Fuel, kg/hr	2.2	2.2	2.2

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC, g/kW-hr (g/hp-hr)	10.11	(7.54)	HC	28.72	6.11
CO, g/kW-hr (g/hp-hr)	95.29	(71.06)	CO	270.71	57.58
NOX, g/kW-hr (g/hp-hr)	11.61	(8.66)	NOX	32.98	7.02
Methane, g/kW-hr (g/hp-hr)	0.40	(0.30)	Methane	1.14	0.24
SFC, kg/kW-hr (lb/hp-hr)	0.352	(0.579)	FUEL CONS.	--	213.
WORK, kW-hr (hp-hr)	6.29	(8.43)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-7 (Cont'd).ENGINE 20 SUMMARY OF RESULTS
1972 Ford 300

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 20-3	Speed	Torque	Power	Speed	Torque	Power
Standard Error	36.	11.%	7.%	33.	8.%	4.%
Slope	.998	.947	.986	1.001	.973	1.000
Corr. Coef.	.9982	.8915	.9586	.9985	.9491	.9781
Intercept	10.	5.9	1.1	10.	2.6	0.1
Points Used	1144	1090	1090	1144	1113	1113
kW-hr Dev.[b]	----------	+4.8	----------	----------	+3.9	----------
TEST 20-4						
Standard Error	36.	13.%	8.%	35.	8.%	5.%
Slope	1.000	.919	.976	.999	.962	.996
Corr. Coef.	.9982	.8649	.9518	.9983	.9457	.9785
Intercept	10.	7.2	1.2	15.	3.1	0.2
Points Used	1144	1090	1090	1144	1123	1123
kW-hr Dev.[b]	----------	+3.2	----------	----------	+3.4	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 20-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	46.73	17.78	14.96	10.62	17.45	14.47	14.87	11.56
CO, gram	149.91	124.83	328.67	87.99	73.35	100.42	327.13	83.11
CO_2, gram	738.6	1298.5	3301.8	619.2	648.3	1262.9	3289.2	631.5
NOX, gram	3.49	13.11	42.98	4.81	5.02	14.74	45.14	5.17
FUEL, kg	0.354	0.489	1.219	0.249	0.258	0.462	1.214	0.252
KW-HR	0.61	1.23	3.94	0.57	0.56	1.24	3.93	0.56
TEST 20-4								
HC, gram	51.19	17.90	15.36	8.68	19.12	13.58	15.73	10.97
CO, gram	141.86	127.60	327.31	91.72	72.53	102.75	324.53	84.12
CO_2, gram	678.3	1309.4	3355.4	595.9	649.0	1278.5	3348.4	615.1
NOX, gram	3.43	13.69	46.62	4.91	5.13	15.18	52.38	5.29
FUEL, kg	0.335	0.494	1.235	0.242	0.260	0.468	1.232	0.247
KW-HR	0.55	1.21	3.93	0.56	0.55	1.22	3.94	0.56

[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c] Barometric Pressure: Test 20-3 = 741 mm Hg Test 20-4 = 744 mm Hg.

TABLE C-7 (Cont'd). ENGINE 20 SUMMARY OF RESULTS
1972 Ford 300

ENGINE DESCRIPTION

Engine: 1972 Ford 300 CID No. F60BCN42126
Carburetor: 1 barrel Motorcraft No. D2TZ-9510-AA Replacement Kit
Distributor: Rebuilt Unit No. C9TZ-12127-FRM (C6TF-12127-AG on unit)
Rated Power: 165 hp @ 3600 rpm
Maximum Torque: 294 ft/lb @ 2000
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	220 @ 1200
Max. Engine Power, HP @ RPM	N.A.	118 @ 3400
Cylinder Compression, psi min.-max. (avg.)	75% of High	115-135(125)
Idle RPM	600	600

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 73°F Baro. - 29.28"Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	220	2100	215	3100	196	4100	-
-	-	1200	220	2200	215	3200	192	4200	-
-	-	1300	218	2300	213	3300	187	4300	-
400	155	1400	217	2400	212	3400	182	4400	-
500	185	1500	218	2500	210	3500	175	4500	-
600	194	1600	216	2600	208	3600	170	4600	-
700	192	1700	215	2700	207	3700	162	4700	-
800	204	1800	215	2800	204	3800	153	4800	-
900	209	1900	215	2900	203	3900	145	4900	-
1000	218	2000	215	3000	199	4000	135	5000	-

VEHICLE DESCRIPTION

1972 Ford 600 Flat-bed Truck
Transmission: Manual GVW: 16,000

TABLE C-7 (Cont'd). ENGINE 20 SUMMARY OF RESULTS
1972 Ford 300

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 20-3									
1	Idle	0	0.232	41.37	176.53	757.81	0.14	0.364	0.00
2	25%	75	0.077	4.23	10.71	1477.75	13.73	0.491	1.20
3	55%	165	0.147	10.18	29.14	4611.45	75.99	1.581	5.09
4	25%	75	0.077	4.27	11.66	1434.33	14.47	0.484	1.19
5	10%	30	0.057	4.10	8.61	774.43	3.25	0.261	0.36
6	25%	75	0.077	4.72	11.65	1412.06	14.36	0.484	1.20
7	90%	268	0.113	14.60	449.43	4883.23	54.58	1.857	6.35
8	25%	75	0.077	3.91	11.02	1467.87	13.15	0.484	1.19
9	CT	0	0.143	69.64	24.44	397.60	0.26	0.223	0.00
Test 20-4									
1	Idle	0	0.232	44.88	178.59	681.52	0.33	0.458	0.00
2	25%	75	0.077	4.28	10.18	1523.49	18.57	0.512	1.20
3	55%	165	0.147	9.88	28.95	4538.95	76.81	1.518	5.09
4	25%	75	0.077	3.96	10.93	1452.99	14.48	0.484	1.20
5	10%	47	0.057	3.45	8.85	810.40	3.49	0.261	0.57
6	25%	75	0.077	4.23	11.01	1444.77	18.61	0.484	1.20
7	90%	268	0.113	13.86	427.52	4884.72	53.36	1.827	6.35
8	25%	73	0.077	3.95	11.23	1516.28	15.01	0.484	1.18
9	CT	0	0.143	83.54	29.02	370.31	0.00	0.283	0.00

IDLE RESULTS[e]

	Bagged Undiluted	Calc. from Bagged Dilute
Test 20-3		
HC, ppm	--	18020.
CO, %	--	3.88
CO_2, %	9.13	--
	FUEL 2.2 kg/hr	D.R.[f] 143
Test 20-4		
HC, ppm	--	17730.
CO, %	--	3.85
CO_2, %	9.16	--[f]
	FUEL 2.2 kg/hr	D.R.[f] 143

[d]Barometric Pressure: Test 20-3 = 739 mm Hg Test 20-4 = 744 mm Hg
[e]Idle Speed: Test 20-3 600 rpm Test 20-4 600 rpm
[f]Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-8. ENGINE 21 SUMMARY OF RESULTS
1973 IHC 304

TRANSIENT CYCLE

	Test 21-1			Test 21-2			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	6.52	5.19	5.38	7.78	5.14	5.52	5.45
CO, g/kW-hr	127.40	115.44	117.15	123.77	110.50	112.40	114.78
CO_2, g/kW-hr	960.	939.	942.	959.	921.	926.	934.
NOX, g/kW-hr	7.50	7.76	7.72	8.03	8.16	8.14	7.93
SFC, kg/kW-hr	0.372	0.358	0.360	0.371	0.350	0.353	0.357
WORK, kW-hr	7.34	7.43	7.42	7.49	7.52	7.52	7.47
POWER, kW	22.64	22.92	22.88	23.11	23.20	23.19	23.04
Methane, g/kW-hr	0.43	0.32	0.34	0.44	0.31	0.33	0.34

NINE MODE

	Test 21-1	Test 21-2	Average
HC, g/kW-hr	9.43	10.18	9.18
CO, g/kW-hr	77.39	73.37	75.38
CO_2, g/kW-hr	986.7	1000.5	993.6
NOX, g/kW-hr	8.70	8.86	8.78
SFC, kg/kW-hr	0.397	0.412	0.405
POWER, kW	18.11	17.83	17.97

IDLE

	Test 21-1	Test 21-2	Average
RPM	695	705	700
HC, ppmC	1376	1785	1581
CO, %	0.19	0.33	0.26
CO_2, %	11.19	13.68	12.44
Fuel, kg/hr	2.3	2.2	2.3

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km[a]
HC, g/kW-hr (g/hp-hr)	5.45	(4.06)	HC	15.27	3.91
CO, g/kW-hr (g/hp-hr)	114.78	(85.59)	CO	321.51	82.36
NOX, g/kW-hr (g/hp-hr)	7.93	(5.91)	NOX	22.21	5.69
Methane, g/kW-hr (g/hp-hr)	0.34	(0.25)	Methane	0.95	0.24
SFC, kg/kW-hr (lb/hp-hr)	0.357	(0.587)	FUEL CONS.	-	256.
WORK, kW-hr (hp-hr)	7.47	(10.02)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-8 (Cont'd). ENGINE 21 SUMMARY OF RESULTS
1973 IHC 304

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 21-1	Speed	Torque	Power	Speed	Torque	Power
Standard Error	94.	9.%	7.%	60.	8.%	8.%
Slope	.993	.960	.993	.984	.952	.992
Corr. Coef.	.9906	.9385	.9608	.9960	.9492	.9614
Intercept	7.	4.3	.8	33.	6.4	1.1
Points Used	1144	1144	1144	1144	1144	1144
kW-hr Dev.[b]	----------	1.9	----------	----------	3.1	----------
TEST 21-2						
Standard Error	62.	7.%	7.%	65.	8.%	7.%
Slope	.995	.968	.996	.985	.949	.990
Corr. Coef.	.9959	.9530	.9743	.9954	.9457	.9747
Intercept	20.	6.4	1.6	40.	7.4	1.6
Points Used	1144	1130	1130	1144	1141	1141
kW-hr Dev.[b]	----------	3.8	----------	----------	4.2	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 21-1	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	15.65	8.01	19.63	4.57	6.67	7.47	19.25	5.22
CO, gram	119.61	135.56	598.13	82.37	61.52	117.31	596.68	82.74
CO_2, gram	960.	1618.	3689.	780.	821.	1567.	3769.	823.
NOX, gram	4.07	11.92	35.30	3.81	4.14	12.79	36.59	4.17
FUEL, kg	0.378	0.585	1.479	0.291	0.296	0.560	1.503	0.306
KW-HR	0.57	1.42	4.71	0.65	0.59	1.47	4.71	0.66
TEST 21-2								
HC, gram	24.89	9.10	19.50	4.74	6.55	8.00	19.56	4.53
CO, gram	146.97	129.83	570.15	79.70	63.81	115.20	572.97	78.66
CO_2, gram	951.	1645.	3772.	811.1	815.1	1555.2	3732.1	819.4
NOX, gram	4.17	13.27	38.34	4.32	4.32	13.92	38.76	4.32
FUEL, kg	0.397	0.592	1.491	0.300	0.295	0.555	1.480	0.302
KW-HR	0.59	1.48	4.74	0.68	0.61	1.50	4.74	0.67

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 21-1 = 751 mm Hg Test 21-2 = 754 mm Hg.

TABLE C-8 (Cont'd). ENGINE 21 SUMMARY OF RESULTS
1974 IHC 304

ENGINE DESCRIPTION

Engine: 1973 International Harvester 304
Carburetor: Holley 2-barrel No. 427908C9
Distributor: IHC No. 428095C91
Rated Power: 147 hp @ 3900 rpm
Maximum Torque: 240 ft/lb @ 2400 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	230 @ 2400
Max. Engine Power, HP @ RPM	N.A.	128 @ 3900
Cylinder Compression, psi min.-max. (avg.)	--	125-135(130)
Idle RPM	700	700

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	199	2100	229	3100	212	4100	165
-	-	1200	206	2200	230	3200	207	4200	160
-	-	1300	212	2300	230	3300	202	4300	156
-	-	1400	221	2400	230	3400	198	4400	0
500	173	1500	223	2500	230	3500	193	4500	-
600	179	1600	225	2600	229	3600	190	4600	-
700	184	1700	228	2700	227	3700	183	4700	-
800	186	1800	229	2800	224	3800	179	4800	-
900	185	1900	229	2900	222	3900	174	4900	-
1000	193	2000	230	3000	217	4000	170	5000	-

VEHICLE DESCRIPTION

No Vehicle

TABLE C-8 (Cont'd). ENGINE 21 SUMMARY OF RESULTS
1973 IHC 304

NINE-MODE MODAL RESULTS[d]

		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
Test 21-1									
1	Idle	0	0.232	5.60	19.88	1336.3	0.70	0.495	0.00
2	25%	83	0.077	6.73	66.56	1531.3	10.82	0.559	1.33
3	55%	179	0.147	19.23	106.95	4583.0	76.19	1.627	5.50
4	25%	81	0.077	6.59	70.82	1476.6	10.83	0.576	1.31
5	10%	33	0.057	2.12	23.15	836.3	2.46	0.313	0.39
6	25%	83	0.077	7.14	68.31	1521.2	11.76	0.587	1.33
7	90%	293	0.113	30.80	949.06	4522.3	34.05	2.178	6.94
8	25%	81	0.077	6.59	76.30	1478.9	10.73	0.559	1.31
9	CT	0	0.143	85.94	21.42	593.7	0.26	0.305	0.00
Test 21-2									
1	Idle	0	0.232	5.18	14.34	1285.4	0.75	0.516	0.00
2	25%	80	0.077	6.24	57.49	1502.8	10.93	0.562	1.29
3	55%	176	0.147	19.51	108.33	4605.6	75.39	1.727	5.43
4	25%	80	0.077	6.13	59.50	1487.1	10.84	0.576	1.29
5	10%	34	0.057	1.95	19.57	846.9	2.46	0.328	0.40
6	25%	80	0.077	6.35	56.38	1487.3	11.33	0.576	1.29
7	90%	289	0.113	29.57	903.61	4533.9	35.19	2.122	6.84
8	25%	80	0.077	6.14	61.50	1493.9	10.78	0.594	1.29
9	CT	0	0.143	100.40	27.49	595.3	0.30	0.344	0.00

IDLE RESULTS[e]

		Bagged Undiluted	Calc. from Bagged Dilute
Test 21-1			
HC,	ppm	-	1376
CO,	%	-	0.19
CO_2,	%	11.19	-
		Fuel 2.3 kg/hr	D.R.[f] 86
Test 21-2			
HC,	ppm	-	1785
CO,	%	-	0.33
CO_2,	%	13.68	-
		Fuel 2.2 kg/hr	D.R.[f] 105

[d] Barometric Pressure: Test 21-1 = mmHg Test 21-2 = 751 mmHg
[e] Idle Speed: Test 21-1=695 rpm Test 21-2=705 rpm
[f] Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-9. ENGINE 22 SUMMARY OF RESULTS
1973 GMC 366 [a]

TRANSIENT CYCLE

	TEST 22-3			TEST 22-4			
	Cold	Hot	Composite	Cold	Hot	Composite	Average
HC, g/kW-hr	10.23	7.36	7.77	11.56	7.22	7.84	7.81
CO, g/kW-hr	191.38	173.09	175.70	195.17	170.84	174.32	175.01
CO_2, g/kW-hr	982.	949.	954.	1023.	1013.	1014.	984.
NOX, g/kW-hr	6.48	6.26	6.29	6.62	6.55	6.56	6.43
SFC, kg/kW-hr	0.414	0.392	0.395	0.431	0.411	0.414	0.405
WORK, kW-hr	8.14	8.17	8.17	8.11	8.16	8.15	8.16
POWER, kW	25.11	25.20	25.19	25.02	25.17	25.15	25.17
Methane, g/kW-hr	0.79	0.56	0.59	0.81	0.58	0.61	0.60

NINE MODE

	Test 22-2	Test 22-3	Average
HC, g/kW-hr	8.60	8.53	8.57
CO, g/kW-hr	132.77	130.59	131.68
CO_2, g/kW-hr	1010.3	1005.6	1008.0
NOX, g/kW-hr	5.60	5.67	5.64
SFC, kg/kW-hr	0.395	0.398	0.397
POWER, kW	21.5	21.6	21.6

IDLE

	Test 22-2	Test 22-3	Average
RPM	525	535	530
HC, ppmC	4940	4940	4940
CO, %	1.87	1.87	1.87
CO_2, %	11.66	11.66	11.66
Fuel, kg/hr	1.6	1.8	1.7

TRANSIENT CYCLE AVERAGE VALUES

			g/kg Fuel	g/km [b]
HC,	g/kW-hr (g/hp-hr)	7.81 (5.82)	HC	19.28	6.12
CO,	g/kW-hr (g/hp-hr)	175.01 (130.51)	CO	432.1	137.18
NOX,	g/kW-hr (g/hp-hr)	6.43 (4.79)	NOX	15.88	5.04
Methane	g/kW-hr (g/hp-hr)	0.60 (0.45)	Methane	1.48	0.47
SFC,	kg/kW-hr (lb/hp-hr)	0.405 (0.666)	FUEL CONS.	--	317.
WORK,	kW-hr (hp-hr)	8.16 (10.94)			

[a] Was previously tested as Engine 11
[b] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-9 (Cont'd). ENGINE 22 SUMMARY OF RESULTS
1973 GMC 366

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 22-3	Speed	Torque	Power	Speed	Torque	Power
Standard Error	91.	8.%	6.%	98.	8.%	6.%
Slope	.978	.929	.974	.974	.902	.964
Corr. Coef.	.9921	.9421	.9806	.9909	.9337	.9794
Intercept	41.	8.9	1.4	50.	11.0	1.5
Points Used	1144	1136	1136	1144	1144	1144
kW-hr Dev.[c]	----------	-5.3	----------	----------	-4.9	----------
TEST 22-4						
Standard Error	93.	9.%	6.%	95.	9.%	6.%
Slope	.979	.929	.976	.977	.886	.958
Corr. Coef.	.9918	.9263	.9738	.9915	.9198	.9754
Intercept	31.	9.0	1.2	39.	13.8	1.8
Points Used	1144	1134	1134	1144	1144	1144
kW-hr Dev.[c]	----------	-5.6	----------	----------	-5.0	----------

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
TEST 22-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	25.64	18.83	30.95	7.89	8.41	14.48	30.45	6.82
CO, gram	210.14	230.28	1003.74	114.08	111.22	205.96	995.04	102.18
CO_2, gram	964.8	1872.3	4336.2	819.1	854.7	1739.1	4332.2	826.0
NOX, gram	4.37	12.31	32.13	3.98	3.58	11.39	32.30	3.90
FUEL, kg	0.434	0.723	1.895	0.323	0.333	0.665	1.889	0.318
KW-HR	0.63	1.61	5.26	0.64	0.66	1.60	5.27	0.64
TEST 22-4								
HC, gram	35.85	19.66	32.04	6.25	7.26	14.78	30.09	6.83
CO, gram	221.29	223.07	1033.70	105.40	106.38	189.10	990.51	108.75
CO_2, gram	1002.6	1919.3	4502.8	872.0	894.9	1869.3	4588.6	915.0
NOX, gram	4.95	13.59	30.94	4.25	3.98	12.66	32.09	4.78
FUEL, kg	0.462	0.735	1.964	0.333	0.342	0.698	1.967	0.349
KW-HR	0.62	1.57	5.28	0.63	0.63	1.59	5.28	0.66

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 22-3 = 735 mm Hg Test 22-4 = 743 mm Hg.

TABLE C-9 (ont'd). ENGINE 22 SUMMARY OF RESULTS
1973 GMC 366

ENGINE DESCRIPTION

Engine: 1973 GMC 366 V-8 No. TO818TOA
Carburetor: Holley 4-barrel #685981
Distributor: Delco-Remy No. 1111365
Rated Power: 200 hp @ 4000 rpm
Maximum Torque: 310 ft/lb @ 2800 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	N.A.	286 @ 2700
Max. Engine Power, HP @ RPM	N.A.	178 @ 4000
Cylinder Compression, pse min.-max. (avg.)	75% of High	115-123(125)
Idle RPM	550	550
Comments:		

POWER MAPPING (TQ in ft-lb) @ Temp. - Baro. -

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-	-	1100	221	2100	281	3100	285	4100	
-	-	1200	228	2200	282	3200	281	4200	
-	-	1300	237	2300	284	3300	285	4300	
400	210	1400	239	2400	285	3400	270	4400	
500	221	1500	246	2500	286	3500	263	4500	
600	223	1600	254	2600	286	3600	255	4600	
700	214	1700	262	2700	286	3700	253	4700	
800	212	1800	270	2800	285	3800	245	4800	
900	212	1900	274	2900	284	3900	238	4900	
1000	216	2000	281	3000	289	4000	234	5000	

VEHICLE DESCRIPTION

1973 GMC Van
Transmission: Manual GVW: 19,000-24,000

TABLE C-9 (Cont'd). ENGINE 22 SUMMARY OF RESULTS
1973 GMC 366

NINE-MODE MODAL RESULTS[e]

Test		Torque N.m	Weighting Factor	Weighted Emissions, grams/hour HC	CO	CO_2	NO_x	Weighted Fuel & Power kg/hr	kW
1	Idle	0	0.232	13.17	84.55	947.7	0.31	0.316	0.00
2	25%	99	0.077	6.19	91.94	2056.8	8.45	0.699	1.59
3	55%	210	0.147	19.18	164.58	6071.7	64.05	2.034	6.48
4	25%	96	0.077	6.36	113.97	1998.9	7.56	0.692	1.55
5	10%	39	0.057	1.61	35.31	1178.7	2.26	0.401	0.47
6	25%	99	0.077	6.39	106.94	2020.7	8.21	0.702	1.59
7	90%	348	0.113	50.63	2089.70	5105.3	21.30	2.768	8.25
8	25%	96	0.077	6.55	115.97	1998.4	8.16	0.699	1.55
9	CT	0	0.143	74.56	48.44	319.5	0.15	0.175	0.00
Test									
1	Idle	0	0.232	11.44	83.72	926.2	0.39	0.389	0.00
2	25%	98	0.077	6.01	93.89	2027.5	8.50	0.706	1.57
3	55%	216	0.147	18.96	172.84	6142.1	65.62	2.087	6.64
4	25%	102	0.077	6.63	102.75	2028.6	9.11	0.709	1.64
5	10%	41	0.057	1.41	33.84	1163.7	2.13	0.388	0.49
6	25%	95	0.077	6.02	98.05	2015.9	8.14	0.699	1.53
7	90%	346	0.113	47.88	2053.34	5069.4	20.39	2.717	8.18
8	25%	98	0.077	7.13	121.10	2001.3	8.01	0.727	1.57
9	CT	0	0.143	79.02	63.58	363.8	0.19	0.182	0.00

IDLE RESULTS[f]

		Bagged Undiluted	Calc. from Bagged Dilute
Test 22-2			
HC,	ppm	--	4940
CO,	%	--	1.87
CO_2,	%	11.66	--
		Fuel 1.6 lg.hr	130 D.R.[g]
Test 22-3			
HC,	ppm	--	4940
CO,	%	--	1.87
CO_2,	%	11.66	--
		Fuel 1.8 kg/hr	130 D.R.[g]

[e]Barometric Pressure: Test 22-2 = 737 mmHg Test 22-3 = 733 mmHg
[f]Idle Speed: Test 22-2=525 rpm Test 22-3=535 rpm
[g]Calculated Dilution Ratio based on carbon dioxide values minus background for Dilute and Undiluted.

TABLE C-10. ENGINE 11 SUMMARY OF RESULTS
1973 GMC 366

TRANSIENT CYCLE

		TEST 11-6			TEST 11-8			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	15.73	13.89	14.15	20.48	15.00	15.78	14.97
CO,	g/kW-hr	273.58	226.41	233.15	252.37	223.89	227.96	230.56
CO_2,	g/kW-hr	928.	919.	920.	999.	898.	912.	916.
NOX,	g/kW-hr	3.36	3.62	3.58	4.31	3.64	3.74	3.66
SFC,	kg/kW-hr	0.444	0.416	0.420	0.461	0.409	0.416	0.418
WORK,	kW-hr	8.06	8.03	8.03	8.05	8.01	8.02	8.02
POWER,	kW	24.87	24.77	23.78	24.83	24.71	24.73	24.76

NINE MODE

		Test 11-1	Test 11-2	Average
HC,	g/kW-hr	15.39	14.06	14.73
CO,	g/kW-hr	183.04	188.74	185.89
NOX,	g/kW-hr	5.43	5.56	5.50
SFC,	kg/kW-hr	0.440	0.435	0.438
POWER,	kW			

IDLE

		Test	Test	Average
RPM				
HC,	ppmC			
CO,	%		N.A.	
CO_2,	%			
Fuel,	kg/hr			

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	14.97	(11.16)	HC	35.81	11.53
CO,	g/kW-hr	(g/hp-hr)	230.56	(171.93)	CO	551.58	177.63
NOX,	g/kW-hr	(g/hp-hr)	3.66	(2.73)	NOX	8.76	2.82
SFC,	kg/kW-hr	(lb/hp-hr)	0.418	(0.687)	FUEL CONS.	--	322.
WORK,	kW-hr	(hp-hr)	8.02	(10.71)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE C-10 (Cont'd). ENGINE 11 SUMMARY OF RESULTS
1973 GMC 366

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 11-6	Speed	Torque	Power	Speed	Torque	Power
Standard Error	46.	11.%	8.%	52.	8.%	7.%
Slope	1.007	.910	.975	1.003	.949	.981
Corr. Coef.	.9977	.8886	.9625	.9970	.9386	.9702
Intercept	23.	12.9	2.9	37.	7.1	2.1
Points Used	1144	1119	1119	1144	1138	1138
kW-hr Dev.[c]						
TEST 11-8						
Standard Error	52.	9.%	8.%	45.	7.%	6.%
Slope	1.004	.932	.963	1.008	.948	.972
Corr. Coef.	.9970	.9214	.9699	.9977	.9572	.9755
Intercept	11.	9.8	2.7	11.	5.9	1.9
Points Used	1144	1117	1117	1144	1138	1138
kW-hr Dev.[c]						

TRANSIENT CYCLE MODAL RESULTS[d]

	Cold Cycle				Hot Cycle			
Test 11-6	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	55.21	31.33	27.62	12.67	32.22	27.13	32.31	19.90
CO, gram	439.27	323.66	1257.28	185.18	147.38	291.79	1206.08	173.14
CO_2, gram	872.2	1809.1	3932.4	869.0	799.8	1723.2	3999.6	854.3
NOX, gram	2.36	9.52	12.61	2.61	2.95	9.11	14.39	2.66
FUEL, kg	0.548	0.762	1.890	0.378	0.357	0.715	1.891	0.375
KW-HR	0.70	1.56	5.11	0.70	0.67	1.56	5.11	0.70
TEST 11-8								
HC, gram	65.95	40.75	35.71	22.34	35.90	30.66	32.61	20.99
CO, gram	292.80	335.28	1225.56	176.98	145.84	280.55	1185.33	181.37
CO_2 gram	975.6	1896.4	4273.4	895.6	819.5	1699.7	3796.7	874.6
NOX, gram	3.37	10.17	18.47	2.66	3.03	9.22	14.01	2.85
FUEL, kg	0.519	0.805	1.990	0.392	0.366	0.705	1.817	0.387
KW-HR	0.70	1.59	5.07	0.69	0.67	1.57	5.08	0.69

[c]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[d]Barometric Pressure: Test 11-6 = 742 mm Hg Test 11-8 = 735 mm Hg.

TABLE C-10 (Cont'd). ENGINE 11 SUMMARY OF RESULTS
1973 GMC 366

ENGINE DESCRIPTION

Engine: 1973 General Motors 366 CID No. T0818T0A
Carburetor: Holley 4-barrel No. 685981
Distributor: Delco-Remy No. 1111365
Rated Power: 200 hp @ 4000 rpm
Maximum Torque: 310 ft/lbs @ 2800 rpm
Comments:

ENGINE DATA

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	310 @ 2800	273 @ 2100
Max. Engine Power, HP @ RPM	200 @ 4000	161 @ 3700
Cylinder Compression, psi min.-max. (avg.)		125-146 (132)
Idle RPM	550	550

Comments: Rated Power and Maximum Torque are not applicable.

POWER MAPPING (TQ in ft-lb) @ Temp. - 74 Baro. - 29.08

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	211	2100	273	3100	248	4100	
-		1200	219	2200	271	3200	247	4200	
-		1300	230	2300	267	3300	242	4300	
400	216	1400	235	2400	268	3400	239	4400	
500	212	1500	245	2500	264	3500	238	4500	
600	206	1600	255	2600	263	3600	234	4600	
700	190	1700	260	2700	260	3700	229	4700	
800	193	1800	266	2800	254	3800	221	4800	
900	199	1900	269	2900	256	3900	123	4900	
1000	202	2000	273	3000	253	4000	0	5000	

APPENDIX D

NO_X BASELINE DATA COMPUTER PRINTOUTS

Table Number	Engine Number	Description
D-1	14	1972 Ford 361
D-2	15	1973 Dodge 413
D-3	16	1973 Chevrolet 454
D-4	17	1973 GMC 427
D-5	18	1972 Chevrolet 350
D-6	19	1972 IHC 345
D-7	20	1972 Ford 300
D-8	21	1973 IHC 304
D-9	22	1973 GMC 366
D-10	11[a]	1973 GMC 366

[a]Engine 11 was retested as Engine 22.

TABLE D-1A. TEST 14-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 9

TEST NO.14-2 RUN
DATE 8/17/79
TIME 09:39
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 743.46 MM HG(29.27 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 68 PCT
ABSOLUTE HUMIDITY 11.3 GM/KG(78.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0180

BAG RESULTS	1	2	3	4
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8084	8316	7190
TIME SECONDS	272.0	306.9	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	182.6 (6451)	205.7 (7266)	210.0 (7418)	183.1 (6468)
HC SAMPLE METER/RANGE/PPM	59.1/ 3/ 591	49.0/ 3/ 490	37.0/ 3/ 370	24.4/ 3/ 244
HC BCKGRD METER/RANGE/PPM	3.6/ 3/ 36	5.4/ 3/ 54	5.1/ 3/ 51	4.8/ 3/ 48
CO SAMPLE METER/RANGE/PPM	38.8/ 3/ 1125	63.6/ 3/ 1820	66.6/ 2/ 4285	34.1/ 3/ 990
CO BCKGRD METER/RANGE/PPM	1.0/ 3/ 29	.4/ 3/ 11	.7/ 2/ 42	1.0/ 3/ 29
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .30	29.7/ 3/ .48	63.2/ 3/ 1.10	17.5/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.8/ 3/ .06	2.9/ 3/ .04	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.8/ 2/ 13	25.9/ 2/ 26	64.9/ 2/ 65	12.4/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.5/ 2/ 1	.8/ 2/ 1	1.0/ 2/ 1
DILUTION FACTOR	28.45	19.13	8.65	34.31
HC CONCENTRATION PPM	556	439	325	197
CO CONCENTRATION PPM	1067	1753	4064	936
CO2 CONCENTRATION PCT	.26	.42	1.06	.22
NOX CONCENTRATION PPM	12.4	25.4	64.2	11.4
HC MASS GRAMS	58.60	52.07	39.35	20.85
CO MASS GRAMS	226.91	420.00	993.80	199.63
CO2 MASS GRAMS	860.3	1591.0	4091.8	742.2
NOX MASS GRAMS	4.42	10.19	26.25	4.08
FUEL KG (LB)	.442 (.97)	.762 (1.68)	1.822 (4.02)	.354 (.78)
KW HR (HP HR)	.60 (.81)	1.43 (1.92)	4.86 (6.52)	.61 (.82)
BSHC G/KW HR (G/HP HR)	97.44 (72.66)	36.46 (27.19)	8.09 (6.03)	34.24 (25.53)
BSCO G/KW HR (G/HP HR)	377.32 (281.37)	294.06 (219.28)	204.34 (152.37)	327.86 (244.49)
BSCO2 G/KW HR (G/HP HR)	1430.63 (1066.82)	1113.91 (830.65)	841.31 (627.36)	1218.93 (908.95)
BSNOX G/KW HR (G/HP HR)	7.34 (5.47)	7.13 (5.32)	5.40 (4.03)	6.69 (4.99)
BSFC KG/KW HR (LB/HP HR)	.735 (1.209)	.533 (.877)	.375 (.616)	.581 (.955)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		7.50 (10.06)
BSHC	G/KW HR (G/HP HR)	22.78 (16.98)
BSCO	G/KW HR (G/HP HR)	245.31 (182.93)
BSCO2	G/KW HR (G/HP HR)	971 (724)
BSNOX	G/KW HR (G/HP HR)	5.99 (4.47)
BSFC	KG/KW HR (LB/HP HR)	.450 (.740)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)		0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.000	(0.000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.000	(0.000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)		0.00 (0.0)

TABLE D-1A (CONT'D). TEST 14-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 9

TEST NO.14-2 RUN
DATE 8/17/79
TIME 10:19
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 743.46 MM HG(29.27 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 64 PCT
ABSOLUTE HUMIDITY 11.8 GM/KG(82.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0364

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8084	8316	7188
TIME SECONDS	272.0	307.0	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	182.6 (6450)	205.7 (7266)	210.0 (7418)	183.1 (6466)
HC SAMPLE METER/RANGE/PPM	23.5/ 3/ 235	27.0/ 3/ 270	31.4/ 3/ 314	20.2/ 3/ 202
HC BCKGRD METER/RANGE/PPM	4.5/ 3/ 45	4.3/ 3/ 43	4.4/ 3/ 44	4.2/ 3/ 42
CO SAMPLE METER/RANGE/PPM	31.2/ 3/ 906	42.8/ 3/ 1239	59.4/ 2/ 3818	30.7/ 3/ 892
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 26	.9/ 3/ 26	.4/ 2/ 24	.6/ 3/ 17
CO2 SAMPLE METER/RANGE/PCT	18.9/ 3/ .29	29.4/ 3/ .47	66.1/ 3/ 1.16	22.0/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	5.2/ 3/ .08	4.6/ 3/ .07	4.5/ 3/ .07	3.6/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.2/ 2/ 12	32.8/ 2/ 33	73.7/ 2/ 74	11.9/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	.9/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	33.13	21.71	8.61	29.71
HC CONCENTRATION PPM	191	229	275	161
CO CONCENTRATION PPM	858	1178	3633	851
CO2 CONCENTRATION PCT	.22	.41	1.10	.29
NOX CONCENTRATION PPM	11.4	32.0	72.9	10.8
HC MASS GRAMS	20.15	27.17	33.32	17.04
CO MASS GRAMS	182.46	282.28	888.50	181.49
CO2 MASS GRAMS	729.4	1527.0	4234.3	981.9
NOX MASS GRAMS	4.14	13.07	30.35	3.93
FUEL KG (LB)	.340 (.75)	.648 (1.43)	1.808 (3.99)	.417 (.92)
KW HR (HP HR)	.42 (.83)	1.45 (1.95)	4.87 (6.53)	.61 (.82)
BSHC G/KW HR (G/HP HR)	32.70 (24.38)	18.73 (13.97)	6.84 (5.10)	27.99 (20.87)
BSCO G/KW HR (G/HP HR)	296.01 (220.74)	194.57 (145.09)	182.40 (136.02)	298.08 (222.27)
BSCO2 G/KW HR (G/HP HR)	1183.34 (882.42)	1052.52 (784.86)	869.27 (648.21)	1612.68 (1202.57)
BSNOX G/KW HR (G/HP HR)	6.71 (5.00)	9.01 (6.72)	6.23 (4.65)	6.46 (4.82)
BSFC KG/KW HR (LB/HP HR)	.552 (.908)	.447 (.735)	.371 (.610)	.684 (1.125)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.55	(10.12)
BSHC G/KW HR (G/HP HR)	12.94	(9.65)
BSCO G/KW HR (G/HP HR)	203.35	(151.64)
BSCO2 G/KW HR (G/HP HR)	990	(738)
BSNOX G/KW HR (G/HP HR)	6.82	(5.09)
BSFC KG/KW HR (LB/HP HR)	.426	(.700)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.000	(0.000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.000	(0.000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE D-1B. TEST 14-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.F 361
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 9

TEST NO. 14-4 RUN
DATE 8/22/79
TIME 09:39
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 740.16 MM HG(29.14 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 70 PCT
ABSOLUTE HUMIDITY 12.5 GM/KG(87.3 GRAINS/LB)

NOX HUMIDITY C.F. 1.0614

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7161	8082	8315	7186
TIME SECONDS	272.0	306.9	315.9	273.0
TOTAL FLOW STD. CU. METRES(SCF)	181.7 (6418)	204.7 (7230)	209.0 (7382)	182.2 (6434)
HC SAMPLE METER/RANGE/PPM	48.0/ 3/ 480	43.8/ 3/ 438	36.0/ 3/ 360	27.1/ 3/ 271
HC BCKGRD METER/RANGE/PPM	2.2/ 3/ 22	3.0/ 3/ 30	3.1/ 3/ 31	3.1/ 3/ 31
CO SAMPLE METER/RANGE/PPM	37.2/ 3/ 1079	64.0/ 3/ 1831	67.4/ 2/ 4336	37.3/ 3/ 1082
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 26	1.2/ 3/ 34	.6/ 2/ 36	2.6/ 3/ 75
CO2 SAMPLE METER/RANGE/PCT	19.8/ 3/ .31	29.5/ 3/ .47	64.7/ 3/ 1.13	18.4/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	4.0/ 3/ .06	4.4/ 3/ .06	4.3/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	12.3/ 2/ 12	25.4/ 2/ 25	64.1/ 2/ 64	12.9/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	0.0/ 2/ 0	.2/ 2/ 0	.5/ 2/ 1
DILUTION FACTOR	29.11	19.34	8.47	32.15
HC CONCENTRATION PPM	459	410	333	241
CO CONCENTRATION PPM	1024	1741	4113	981
CO2 CONCENTRATION PCT	.25	.42	1.07	.22
NOX CONCENTRATION PPM	12.0	25.4	63.9	12.4
HC MASS GRAMS	48.08	48.36	40.10	25.32
CO MASS GRAMS	216.72	415.14	1001.05	208.14
CO2 MASS GRAMS	843.6	1559.3	4111.7	744.2
NOX MASS GRAMS	4.43	10.56	27.12	4.59
FUEL KG (LB)	.421 (.93)	.746 (1.64)	1.832 (4.04)	.363 (.80)
KW HR (HP HR)	.61 (.82)	1.44 (1.93)	4.89 (6.55)	.63 (.85)
BSHC G/KW HR (G/HP HR)	78.96 (58.88)	33.68 (25.12)	8.21 (6.12)	40.10 (29.90)
BSCO G/KW HR (G/HP HR)	355.93 (265.42)	289.14 (215.61)	204.88 (152.78)	329.63 (245.81)
BSCO2 G/KW HR (G/HP HR)	1385.45 (1033.13)	1086.06 (809.87)	841.50 (627.50)	1178.63 (878.90)
BSNOX G/KW HR (G/HP HR)	7.28 (5.43)	7.35 (5.48)	5.55 (4.14)	7.27 (5.42)
BSFC KG/KW HR (LB/HP HR)	.692 (1.138)	.519 (.854)	.375 (.616)	.575 (.945)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.56 (10.14)
BSHC G/KW HR (G/HP HR)	21.40 (15.96)
BSCO G/KW HR (G/HP HR)	243.45 (181.54)
BSCO2 G/KW HR (G/HP HR)	960 (716)
BSNOX G/KW HR (G/HP HR)	6.18 (4.61)
BSFC KG/KW HR (LB/HP HR)	.445 (.731)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.992 (0.00)
MULTIPLIER FOR	G/TEST	1.132
MULTIPLIER FOR	G/KW HR (G/HP HR)	.089 (.067)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.310 (.141)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-1B (CONT'D). TEST 14-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.F 361
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 9

TEST NO. 14-4 RUN
DATE 8/22/79
TIME 10:19 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 740.16 MM HG(29.14 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 66 PCT
ABSOLUTE HUMIDITY 12.1 GM/KG(84.9 GRAINS/LB) — NOX HUMIDITY C.F. 1.0491

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7162	8082	8315	7186
TIME SECONDS	272.0	307.0	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	181.7 (6419)	204.7 (7230)	209.0 (7382)	182.2 (6434)
HC SAMPLE METER/RANGE/PPM	25.4/ 3/ 254	28.9/ 3/ 289	30.0/ 3/ 300	22.1/ 3/ 221
HC BCKGRD METER/RANGE/PPM	2.5/ 3/ 25	2.9/ 3/ 29	3.0/ 3/ 30	2.9/ 3/ 29
CO SAMPLE METER/RANGE/PPM	33.3/ 3/ 967	46.9/ 3/ 1355	58.5/ 2/ 3760	34.4/ 3/ 999
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 14	1.0/ 3/ 29	.5/ 2/ 30	1.6/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	17.9/ 3/ .28	28.1/ 3/ .45	59.1/ 3/ 1.02	17.5/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	3.8/ 3/ .06	3.9/ 3/ .06	4.1/ 3/ .06	4.1/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	11.9/ 2/ 12	30.9/ 2/ 31	59.6/ 2/ 60	12.3/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.4/ 2/ 0	.6/ 2/ 1
DILUTION FACTOR	33.85	22.04	9.50	34.43
HC CONCENTRATION PPM	230	261	273	193
CO CONCENTRATION PPM	928	1288	3580	929
CO2 CONCENTRATION PCT	.22	.39	.97	.21
NOX CONCENTRATION PPM	11.8	30.8	59.2	11.7
HC MASS GRAMS	24.08	30.85	32.93	20.26
CO MASS GRAMS	196.35	307.08	871.26	197.04
CO2 MASS GRAMS	739.0	1472.5	3698.6	704.5
NOX MASS GRAMS	4.30	12.65	24.85	4.28
FUEL KG (LB)	.354 (.78)	.647 (1.43)	1.630 (3.59)	.340 (.75)
KW HR (HP HR)	.62 (.84)	1.46 (1.96)	4.89 (6.55)	.63 (.85)
BSHC G/KW HR (G/HP HR)	38.59 (28.78)	21.16 (15.78)	6.74 (5.03)	32.09 (23.93)
BSCO G/KW HR (G/HP HR)	314.70 (234.67)	210.57 (157.02)	178.31 (132.97)	312.04 (232.69)
BSCO2 G/KW HR (G/HP HR)	1184.50 (883.28)	1009.70 (752.93)	756.96 (564.47)	1115.65 (831.94)
BSNOX G/KW HR (G/HP HR)	6.90 (5.14)	8.68 (6.47)	5.09 (3.79)	6.78 (5.06)
BSFC KG/KW HR (LB/HP HR)	.568 (.934)	.444 (.730)	.334 (.549)	.538 (.885)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.60 (10.19)	
BSHC G/KW HR (G/HP HR)	14.23 (10.61)	
BSCO G/KW HR (G/HP HR)	206.81 (154.22)	
BSCO2 G/KW HR (G/HP HR)	870 (649)	
BSNOX G/KW HR (G/HP HR)	6.06 (4.52)	
BSFC KG/KW HR (LB/HP HR)	.391 (.643)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.992 (0.00)
MULTIPLIER FOR	G/TEST	1.132
MULTIPLIER FOR	G/KW HR (G/HP HR)	.089 (.067)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.310 (.141)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-1C. TEST 14-6 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.F 361
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 9

TEST NO.14-6 RUN
DATE 8/27/79
TIME 08:59
DYNO NO. 2

GASOLINE EM-287-F
BAG CART NO. 2

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 63 PCT
ABSOLUTE HUMIDITY 11.1 GM/KG(77.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0127

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7162	8084	8317	7188
TIME SECONDS	272.0	307.0	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	182.0 (6428)	205.1 (7243)	209.4 (7394)	182.5 (6445)
HC SAMPLE METER/RANGE/PPM	45.4/ 3/ 454	41.5/ 3/ 415	33.0/ 3/ 330	19.1/ 3/ 191
HC BCKGRD METER/RANGE/PPM	2.0/ 3/ 20	2.2/ 3/ 22	2.6/ 3/ 26	2.4/ 3/ 24
CO SAMPLE METER/RANGE/PPM	38.5/ 3/ 1117	63.5/ 3/ 1818	68.9/ 2/ 4434	34.5/ 3/ 1002
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 14	1.0/ 3/ 29	.1/ 2/ 6	1.2/ 3/ 34
CO2 SAMPLE METER/RANGE/PCT	18.8/ 3/ .29	27.9/ 3/ .44	62.6/ 3/ 1.09	16.9/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.3/ 3/ .05	3.2/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	11.7/ 2/ 12	25.4/ 2/ 25	55.8/ 2/ 56	11.4/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	0.0/ 2/ 0	0.0/ 2/ 0	.3/ 2/ 0	.6/ 2/ 1
DILUTION FACTOR	30.10	20.24	8.66	35.56
HC CONCENTRATION PPM	435	394	307	168
CO CONCENTRATION PPM	1074	1739	4246	944
CO2 CONCENTRATION PCT	.24	.40	1.05	.21
NOX CONCENTRATION PPM	11.7	25.4	55.5	10.8
HC MASS GRAMS	45.63	46.61	37.07	17.65
CO MASS GRAMS	227.67	415.19	1035.14	200.55
CO2 MASS GRAMS	804.3	1494.8	4018.0	716.5
NOX MASS GRAMS	4.12	10.09	22.52	3.82
FUEL KG (LB)	.412 (.91)	.724 (1.60)	1.816 (4.00)	.343 (.76)
KW HR (HP HR)	.62 (.84)	1.49 (2.00)	4.96 (6.65)	.63 (.85)
BSHC G/KW HR (G/HP HR)	73.13 (54.53)	31.32 (23.35)	7.47 (5.57)	27.95 (20.84)
BSCO G/KW HR (G/HP HR)	364.90 (272.10)	278.95 (208.02)	208.64 (155.58)	317.61 (236.84)
BSCO2 G/KW HR (G/HP HR)	1289.07 (961.26)	1004.31 (748.91)	809.86 (603.91)	1134.65 (846.11)
BSNOX G/KW HR (G/HP HR)	6.61 (4.93)	6.78 (5.06)	4.54 (3.39)	6.06 (4.52)
BSFC KG/KW HR (LB/HP HR)	.660 (1.085)	.486 (.799)	.366 (.602)	.543 (.893)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.71 (10.33)
BSHC G/KW HR (G/HP HR)	19.07 (14.22)
BSCO G/KW HR (G/HP HR)	243.81 (181.81)
BSCO2 G/KW HR (G/HP HR)	913 (681)
BSNOX G/KW HR (G/HP HR)	5.26 (3.93)
BSFC KG/KW HR (LB/HP HR)	.428 (.703)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.634 (0.00)
MULTIPLIER FOR	G/TEST	1.315
MULTIPLIER FOR	G/KW HR (G/HP HR)	.251 (.187)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.882 (.400)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	56.90 (0.0)

TABLE D-1C (CONT'D). TEST 14-6 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.F 361
ENGINE MODEL 72 FORD 361
ENGINE 5.9 L(361 CID)
CVS NO. 4

TEST NO.14-6 RUN
DATE 8/27/79
TIME 09139
DYNO NO. 2

GASOLINE EM-287-F
BAG CART NO. 2

BAROMETER 741.17 MM HG(29.18 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 61 PCT
ABSOLUTE HUMIDITY 11.3 GM/KG(78.8 GRAINS/LB)

NOX HUMIDITY C.F. 1.0182

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	469.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8085	8316	7188
TIME SECONDS	272.0	307.0	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	182.0 (6430)	205.1 (7244)	209.3 (7393)	182.5 (6445)
HC SAMPLE METER/RANGE/PPM	26.0/ 3/ 260	27.6/ 3/ 276	31.7/ 3/ 317	17.7/ 3/ 177
HC BCKGRD METER/RANGE/PPM	2.0/ 3/ 20	2.3/ 3/ 23	2.5/ 3/ 25	3.5/ 3/ 35
CO SAMPLE METER/RANGE/PPM	32.5/ 3/ 944	47.8/ 3/ 1381	66.7/ 2/ 4291	34.7/ 3/ 1008
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 17	.8/ 3/ 23	.2/ 2/ 12	1.4/ 3/ 40
CO2 SAMPLE METER/RANGE/PCT	17.8/ 3/ .27	28.5/ 3/ .45	64.0/ 3/ 1.12	17.4/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.4/ 2/ 12	32.4/ 2/ 33	63.1/ 2/ 63	12.4/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	1.3/ 2/ 1	1.7/ 2/ 2
DILUTION FACTOR	34.12	21.75	8.59	34.89
HC CONCENTRATION PPM	241	254	295	143
CO CONCENTRATION PPM	904	1320	4104	944
CO2 CONCENTRATION PCT	.24	.42	1.08	.22
NOX CONCENTRATION PPM	12.1	32.6	62.0	10.7
HC MASS GRAMS	25.26	30.05	35.61	15.05
CO MASS GRAMS	191.64	315.24	1000.27	200.63
CO2 MASS GRAMS	792.5	1565.1	4199.8	743.7
NOX MASS GRAMS	4.29	13.03	25.26	3.82
FUEL KG (LB)	.370 (.82)	.680 (1.50)	1.838 (4.05)	.349 (.77)
KW HR (HP HR)	.65 (.87)	1.47 (1.98)	4.94 (6.62)	.59 (.80)
BSHC G/KW HR (G/HP HR)	39.07 (29.14)	20.40 (15.21)	7.21 (5.38)	25.35 (18.90)
BSCO G/KW HR (G/HP HR)	296.44 (221.06)	213.96 (159.55)	202.54 (151.03)	337.85 (251.94)
BSCO2 G/KW HR (G/HP HR)	1225.90 (914.16)	1062.29 (792.15)	839.23 (625.82)	1252.33 (933.86)
BSNOX G/KW HR (G/HP HR)	6.64 (4.95)	8.84 (6.59)	5.11 (3.81)	6.43 (4.80)
BSFC KG/KW HR (LB/HP HR)	.572 (.941)	.461 (.758)	.372 (.612)	.587 (.966)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.65 (10.26)
BSHC G/KW HR (G/HP HR)	13.85 (10.33)
BSCO G/KW HR (G/HP HR)	223.17 (166.42)
BSCO2 G/KW HR (G/HP HR)	947 (706)
BSNOX G/KW HR (G/HP HR)	6.06 (4.52)
BSFC KG/KW HR (LB/HP HR)	.923 (.695)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	.634 (0.00)
MULTIPLIER FOR	G/TEST	1.315
MULTIPLIER FOR	G/KW HR (G/HP HR)	.251 (.187)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	.882 (.400)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	56.90 (0.0)

TABLE D-2A. TEST 15-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 413
ENGINE MODEL 73 DODGE 413
ENGINE 5.9 L(413 CID) V-8
CVS NO. 4

TEST NO. 15-1 RUN
DATE 4/11/79
TIME 08:45 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 64 PCT
ABSOLUTE HUMIDITY 12.2 GM/KG(85.3 GRAINS/LB) — NOx HUMIDITY C.F. 1.0511

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	469.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8316	7163
TIME SECONDS	272.0	307.0	315.4	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.7 (6419)	204.7 (7231)	208.4 (7380)	181.5 (6411)
HC SAMPLE METER/RANGE/PPM	50.0/ 3/ 500	26.0/ 3/ 260	27.8/ 3/ 278	22.9/ 3/ 229
HC BCKGRD METER/RANGE/PPM	1.6/ 3/ 16	2.1/ 3/ 21	2.1/ 3/ 21	2.1/ 3/ 21
CO SAMPLE METER/RANGE/PPM	59.9/ 3/ 1718	58.2/ 3/ 1671	33.0/ 1/ 9717	44.9/ 3/ 1299
CO BCKGRD METER/RANGE/PPM	2.5/ 3/ 72	3.1/ 3/ 89	.3/ 1/ 90	3.0/ 3/ 86
CO2 SAMPLE METER/RANGE/PCT	22.5/ 3/ .35	34.0/ 3/ .55	75.4/ 3/ 1.35	20.6/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.7/ 3/ .04	3.3/ 3/ .05	3.7/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	9.4/ 2/ 9	31.8/ 2/ 32	80.3/ 2/ 80	11.9/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.3/ 2/ 0	.4/ 2/ 0	.7/ 2/ 1
DILUTION FACTOR	23.53	18.14	7.33	28.51
HC CONCENTRATION PPM	485	240	260	209
CO CONCENTRATION PPM	1604	1537	4464	1183
CO2 CONCENTRATION PCT	.32	.51	1.31	.27
NOX CONCENTRATION PPM	9.0	31.5	80.0	11.2
HC MASS GRAMS	50.81	28.36	31.32	21.85
CO MASS GRAMS	339.45	366.34	1086.05	249.99
CO2 MASS GRAMS	1051.5	1929.7	5006.0	891.6
NOX MASS GRAMS	3.29	12.47	33.59	4.10
FUEL KG (LB)	.550 (1.21)	.817 (1.80)	2.147 (4.73)	.427 (.94)
KW HR (HP HR)	.73 (.98)	1.71 (2.30)	5.63 (7.55)	.72 (.97)
BSHC G/KW HR (G/HP HR)	69.68 (51.96)	16.54 (12.34)	5.56 (4.15)	30.28 (22.58)
BSCO G/KW HR (G/HP HR)	465.53 (347.15)	213.75 (159.39)	192.89 (143.84)	346.41 (258.32)
BSCO2 G/KW HR (G/HP HR)	1442.00 (1075.30)	1122.97 (837.40)	889.11 (663.01)	1235.55 (921.35)
BSNOX G/KW HR (G/HP HR)	4.52 (3.37)	7.57 (5.64)	5.97 (4.45)	5.68 (4.23)
BSFC KG/KW HR (LB/HP HR)	.755 (1.241)	.476 (.783)	.381 (.627)	.591 (.972)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.80 (11.79)
BSHC G/KW HR (G/HP HR)	15.05 (11.22)
BSCO G/KW HR (G/HP HR)	232.16 (173.12)
BSCO2 G/KW HR (G/HP HR)	1009 (752)
BSNOX G/KW HR (G/HP HR)	6.13 (4.57)
BSFC KG/KW HR (LB/HP HR)	.498 (.737)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-2A (CONT'D). TEST 15-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 413
ENGINE MODEL 73 DODGE 413
ENGINE 6.8 L(413 CID) V-8
CVS NO. 4

TEST NO. 15-1 RUN
DATE 9/11/79
TIME 09:25 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 11.7 GM/KG(81.7 GRAINS/LB) — NOx HUMIDITY C.F. 1.0324

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8085	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.7 (6417)	204.7 (7231)	208.9 (7380)	181.5 (6410)
HC SAMPLE METER/RANGE/PPM	19.0/ 3/ 190	19.2/ 3/ 192	26.0/ 3/ 260	20.4/ 3/ 204
HC BCKGRD METER/RANGE/PPM	1.8/ 3/ 18	1.8/ 3/ 18	1.8/ 3/ 18	2.0/ 3/ 20
CO SAMPLE METER/RANGE/PPM	37.8/ 3/ 1097	40.6/ 3/ 1177	32.4/ 1/ 4627	45.7/ 3/ 1322
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 20	1.1/ 3/ 32	.1/ 1/ 13	1.0/ 3/ 29
CO2 SAMPLE METER/RANGE/PCT	19.4/ 3/ .30	31.5/ 3/ .51	74.4/ 3/ 1.33	20.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.0/ 3/ .04	3.4/ 3/ .05	3.4/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	15.4/ 2/ 16	41.1/ 2/ 41	96.8/ 2/ 97	15.4/ 2/ 16
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.5/ 2/ 1	1.4/ 2/ 1
DILUTION FACTOR	31.39	20.93	7.46	29.02
HC CONCENTRATION PPM	173	175	244	185
CO CONCENTRATION PPM	1050	1113	4408	1261
CO2 CONCENTRATION PCT	.26	.46	1.29	.26
NOX CONCENTRATION PPM	15.6	40.8	96.4	14.5
HC MASS GRAMS	18.08	20.65	29.46	19.33
CO MASS GRAMS	222.19	265.38	1072.61	266.54
CO2 MASS GRAMS	869.0	1742.4	4921.1	854.3
NOX MASS GRAMS	5.60	16.50	39.77	5.21
FUEL KG (LB)	.402 (.89)	.701 (1.55)	2.112 (4.66)	.421 (.93)
KW HR (HP HR)	.72 (.97)	1.68 (2.25)	5.62 (7.54)	.72 (.97)
BSHC G/KW HR (G/HP HR)	25.06 (18.69)	12.32 (9.18)	5.24 (3.91)	26.79 (19.98)
BSCO G/KW HR (G/HP HR)	307.90 (229.60)	158.31 (118.05)	190.76 (142.25)	369.36 (275.43)
BSCO2 G/KW HR (G/HP HR)	1204.19 (897.96)	1039.44 (775.11)	875.20 (652.63)	1183.84 (882.79)
BSNOX G/KW HR (G/HP HR)	7.76 (5.79)	9.84 (7.34)	7.07 (5.27)	7.23 (5.39)
BSFC KG/KW HR (LB/HP HR)	.557 (.916)	.418 (.688)	.376 (.618)	.583 (.958)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.74 (11.72)
BSHC G/KW HR (G/HP HR)	10.01 (7.47)
BSCO G/KW HR (G/HP HR)	208.95 (155.81)
BSCO2 G/KW HR (G/HP HR)	959 (715)
BSNOX G/KW HR (G/HP HR)	7.67 (5.72)
BSFC KG/KW HR (LB/HP HR)	.416 (.684)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-2A (CONT'D). TEST 15-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 413
ENGINE MODEL 73 DODGE 413
ENGINE 6.8 L(413 CID) V-8
CVS NO. 9

TEST NO. 15-1 RUN
DATE 9/11/79
TIME 09:25
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 739.90 MM HG(29.13 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 11.7 GM/KG(81.7 GRAINS/LB)

NOX HUMIDITY C.F. 1.0324

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8085	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.7 (6417)	204.7 (7231)	208.9 (7380)	181.5 (6410)
HC SAMPLE METER/RANGE/PPM	19.0/ 3/ 190	19.2/ 3/ 192	26.0/ 3/ 260	20.4/ 3/ 204
HC BCKGRD METER/RANGE/PPM	1.8/ 3/ 18	1.8/ 3/ 18	1.8/ 3/ 18	2.0/ 3/ 20
CO SAMPLE METER/RANGE/PPM	37.8/ 3/ 1097	40.6/ 3/ 1177	32.4/ 1/ 4627	45.7/ 3/ 1322
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 20	1.1/ 3/ 32	.1/ 1/ 13	1.0/ 3/ 29
CO2 SAMPLE METER/RANGE/PCT	19.4/ 3/ .30	31.5/ 3/ .51	74.4/ 3/ 1.33	20.1/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	3.0/ 3/ .04	3.4/ 3/ .05	3.9/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	15.9/ 2/ 16	41.1/ 2/ 41	96.8/ 2/ 97	15.9/ 2/ 16
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.5/ 2/ 1	1.4/ 2/ 1
DILUTION FACTOR	31.39	20.93	7.46	29.02
HC CONCENTRATION PPM	173	175	244	185
CO CONCENTRATION PPM	1050	1113	4408	1261
CO2 CONCENTRATION PCT	.26	.46	1.29	.26
NOX CONCENTRATION PPM	15.6	40.8	96.4	14.5
HC MASS GRAMS	18.08	20.65	29.96	19.33
CO MASS GRAMS	222.19	265.38	1072.61	266.54
CO2 MASS GRAMS	869.0	1742.4	4921.1	854.3
NOX MASS GRAMS	5.60	16.50	39.77	5.21
FUEL KG (LB)	.402 (.89)	.701 (1.55)	2.112 (4.66)	.421 (.93)
KW HR (HP HR)	.72 (.97)	1.68 (2.25)	5.62 (7.54)	.72 (.97)
BSHC G/KW HR (G/HP HR)	25.06 (18.69)	12.32 (9.18)	5.24 (3.91)	26.79 (19.98)
BSCO G/KW HR (G/HP HR)	307.90 (229.60)	158.31 (118.05)	190.76 (142.25)	369.36 (275.43)
BSCO2 G/KW HR (G/HP HR)	1204.19 (897.96)	1039.44 (775.11)	875.20 (652.63)	1183.84 (882.79)
BSNOX G/KW HR (G/HP HR)	7.76 (5.79)	9.84 (7.34)	7.07 (5.27)	7.23 (5.39)
BSFC KG/KW HR (LB/HP HR)	.557 (.916)	.418 (.688)	.376 (.618)	.583 (.958)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.74 (11.72)
BSHC G/KW HR (G/HP HR)	10.01 (7.47)
BSCO G/KW HR (G/HP HR)	208.95 (155.81)
BSCO2 G/KW HR (G/HP HR)	959 (715)
BSNOX G/KW HR (G/HP HR)	7.67 (5.72)
BSFC KG/KW HR (LB/HP HR)	.416 (.684)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-2B. TEST 15-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 413
ENGINE MODEL 73 DODGE 413
ENGINE 6.8 L(413 CID) V-8
CVS NO. 9

TEST NO. 15-2 RUN
DATE 9/13/79
TIME 08:31
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.12 MM HG(29.06 IN HG)
DRY BULB TEMP. 23.9 DEG C(75.0 DEG F)

RELATIVE HUMIDITY 63 PCT
ABSOLUTE HUMIDITY 12.1 GM/KG(84.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0486

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8087	8316	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.3 (6403)	204.2 (7214)	208.9 (7361)	181.1 (6395)
HC SAMPLE METER/RANGE/PPM	47.7/ 3/ 477	21.9/ 3/ 219	24.9/ 3/ 249	13.2/ 3/ 132
HC BCKGRD METER/RANGE/PPM	1.2/ 3/ 12	2.1/ 3/ 21	1.9/ 3/ 19	1.9/ 3/ 19
CO SAMPLE METER/RANGE/PPM	59.2/ 3/ 1699	57.9/ 3/ 1663	33.0/ 1/ 4717	39.5/ 3/ 1145
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 26	.2/ 3/ 6	.2/ 1/ 27	3.2/ 3/ 92
CO2 SAMPLE METER/RANGE/PCT	23.4/ 3/ .37	35.2/ 3/ .57	77.5/ 3/ 1.39	21.4/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.6/ 3/ .05	4.4/ 3/ .06	4.9/ 3/ .07
NOX SAMPLE METER/RANGE/PPM	10.3/ 2/ 10	30.1/ 2/ 30	79.8/ 2/ 80	13.1/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.2/ 2/ 0	.4/ 2/ 0	1.0/ 2/ 1
DILUTION FACTOR	23.09	17.75	7.17	29.22
HC CONCENTRATION PPM	466	199	233	114
CO CONCENTRATION PPM	1628	1605	4472	1027
CO2 CONCENTRATION PCT	.32	.52	1.34	.26
NOX CONCENTRATION PPM	9.9	29.9	79.5	12.1
HC MASS GRAMS	48.67	23.46	27.97	11.87
CO MASS GRAMS	393.67	381.82	1085.22	216.63
CO2 MASS GRAMS	1070.8	1953.1	5107.4	875.8
NOX MASS GRAMS	3.61	12.26	33.22	4.41
FUEL KG (LB)	.556 (1.23)	.828 (1.83)	2.176 (4.80)	.395 (.87)
KW HR (HP HR)	.73 (.98)	1.71 (2.30)	5.63 (7.55)	.68 (.92)
BSHC G/KW HR (G/HP HR)	66.75 (49.78)	13.69 (10.21)	4.97 (3.70)	17.35 (12.94)
BSCO G/KW HR (G/HP HR)	471.32 (351.46)	222.78 (166.12)	192.75 (143.73)	316.69 (236.15)
BSCO2 G/KW HR (G/HP HR)	1468.54 (1095.09)	1139.57 (849.78)	907.13 (676.44)	1280.23 (954.67)
BSNOX G/KW HR (G/HP HR)	4.95 (3.69)	7.15 (5.33)	5.90 (4.40)	6.44 (4.80)
BSFC KG/KW HR (LB/HP HR)	.763 (1.255)	.483 (.795)	.386 (.635)	.578 (.950)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.76	(11.74)
BSHC G/KW HR (G/HP HR)	12.79	(9.53)
BSCO G/KW HR (G/HP HR)	231.50	(172.63)
BSCO2 G/KW HR (G/HP HR)	1029	(767)
BSNOX G/KW HR (G/HP HR)	6.11	(4.55)
BSFC KG/KW HR (LB/HP HR)	.492	(.793)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-2B (CONT'D). TEST 15-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 413
ENGINE MODEL 73 DODGE 413
ENGINE 6.8 L(413 CID) V-8
CVS NO. 4

TEST NO. 15-2 RUN
DATE 9/13/79
TIME 09:11
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.12 MM HG(29.06 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 59 PCT
ABSOLUTE HUMIDITY 11.7 GM/KG(81.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.0334

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8315	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.3 (6403)	204.2 (7212)	208.4 (7360)	181.1 (6395)
HC SAMPLE METER/RANGE/PPM	10.7/ 3/ 107	15.3/ 3/ 153	24.5/ 3/ 245	13.5/ 3/ 135
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14	1.7/ 3/ 17	1.8/ 3/ 18	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	38.4/ 3/ 1114	40.3/ 3/ 1168	33.3/ 1/ 4763	39.9/ 3/ 1157
CO BCKGRD METER/RANGE/PPM	2.2/ 3/ 63	1.7/ 3/ 49	.1/ 1/ 13	.7/ 3/ 20
CO2 SAMPLE METER/RANGE/PCT	19.3/ 3/ .30	33.0/ 3/ .53	74.1/ 3/ 1.32	19.9/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	2.0/ 3/ .03	2.2/ 3/ .03	2.4/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	14.1/ 2/ 14	39.6/ 2/ 40	85.9/ 2/ 86	14.3/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.6/ 2/ 1	.9/ 2/ 1
DILUTION FACTOR	32.01	20.25	7.43	30.77
HC CONCENTRATION PPM	93	137	229	119
CO CONCENTRATION PPM	1026	1088	4539	1109
CO2 CONCENTRATION PCT	.27	.50	1.29	.28
NOX CONCENTRATION PPM	13.6	39.1	85.4	13.4
HC MASS GRAMS	9.77	16.12	27.57	12.38
CO MASS GRAMS	216.60	258.78	1101.43	233.74
CO2 MASS GRAMS	899.5	1879.0	4933.2	912.4
NOX MASS GRAMS	4.88	15.79	35.17	4.81
FUEL KG (LB)	.401 (.88)	.737 (1.62)	2.128 (4.69)	.416 (.92)
KW HR (HP HR)	.71 (.95)	1.67 (2.24)	5.62 (7.54)	.68 (.92)
BSHC G/KW HR (G/HP HR)	13.83 (10.31)	9.66 (7.20)	4.90 (3.66)	18.10 (13.50)
BSCO G/KW HR (G/HP HR)	306.53 (228.58)	155.07 (115.63)	195.88 (146.07)	341.70 (254.80)
BSCO2 G/KW HR (G/HP HR)	1272.97 (949.25)	1125.97 (839.63)	877.35 (654.24)	1333.79 (994.61)
BSNOX G/KW HR (G/HP HR)	6.91 (5.15)	9.46 (7.06)	6.26 (4.66)	7.03 (5.24)
BSFC KG/KW HR (LB/HP HR)	.567 (.932)	.441 (.726)	.379 (.622)	.608 (.999)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.68 (11.64)
BSHC G/KW HR (G/HP HR)	7.58 (5.65)
BSCO G/KW HR (G/HP HR)	208.53 (155.50)
BSCO2 G/KW HR (G/HP HR)	993 (741)
BSNOX G/KW HR (G/HP HR)	6.99 (5.21)
BSFC KG/KW HR (LB/HP HR)	.424 (.697)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-3A. TEST 16-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 16
ENGINE MODEL 73 CHEV 454
ENGINE 8.0 L(460 CID) V-8
CVS NO. 9

TEST NO. 01 RUN
DATE 12/13/79
TIME 01:00
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 747.01 MM HG(29.41 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 8.1 GM/KG(57.0 GRAINS/LB)

NOX HUMIDITY C.F. .9218

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	48.9 (120.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8086	8315	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.6 (6486)	206.8 (7305)	214.5 (7576)	183.4 (6476)
HC SAMPLE METER/RANGE/PPM	13.4/ 3/ 134	61.0/ 2/ 61	16.4/ 3/ 164	50.2/ 2/ 50
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	12.3/ 2/ 12	1.4/ 3/ 14	15.2/ 2/ 15
CO SAMPLE METER/RANGE/PPM	26.8/ 3/ 623	74.3/11/ 323	60.5/ 2/ 3084	71.2/11/ 302
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 5	3.3/11/ 10	.6/ 2/ 23	11.6/11/ 35
CO2 SAMPLE METER/RANGE/PCT	27.9/ 3/ .46	41.9/ 3/ .71	83.5/ 3/ 1.54	25.5/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.7/ 3/ .06	4.3/ 3/ .07	4.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	9.7/ 2/ 10	32.2/ 2/ 32	96.2/ 2/ 96	13.8/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.9/ 2/ 1	1.8/ 2/ 2	1.8/ 2/ 2
DILUTION FACTOR	25.16	17.85	7.23	29.72
HC CONCENTRATION PPM	122	49	152	36
CO CONCENTRATION PPM	603	304	2926	262
CO2 CONCENTRATION PCT	.41	.66	1.49	.35
NOX CONCENTRATION PPM	8.9	31.4	99.6	12.1
HC MASS GRAMS	12.87	5.89	18.80	3.76
CO MASS GRAMS	129.04	73.26	730.74	55.89
CO2 MASS GRAMS	1378.4	2498.4	5834.9	1188.6
NOX MASS GRAMS	2.89	11.43	35.80	3.90
FUEL KG (LB)	.511 (1.13)	.830 (1.83)	2.220 (4.89)	.406 (.90)
KW HR (HP HR)	.67 (.90)	1.69 (2.27)	5.86 (7.86)	.66 (.89)
BSHC G/KW HR (G/HP HR)	19.24 (14.35)	3.48 (2.60)	3.21 (2.39)	5.68 (4.23)
BSCO G/KW HR (G/HP HR)	192.88 (143.83)	43.31 (32.30)	124.63 (92.99)	84.48 (63.00)
BSCO2 G/KW HR (G/HP HR)	2060.34 (1536.40)	1477.14 (1101.50)	995.15 (742.08)	1796.86 (1339.92)
BSNOX G/KW HR (G/HP HR)	4.32 (3.22)	6.76 (5.04)	6.11 (4.55)	5.89 (4.40)
BSFC KG/KW HR (LB/HP HR)	.764 (1.256)	.491 (.807)	.379 (.622)	.614 (1.009)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.89 (11.92)
BSHC G/KW HR (G/HP HR)	4.65 (3.47)
BSCO G/KW HR (G/HP HR)	111.30 (83.00)
BSCO2 G/KW HR (G/HP HR)	1227 (915)
BSNOX G/KW HR (G/HP HR)	6.08 (4.53)
BSFC KG/KW HR (LB/HP HR)	.447 (.734)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-3A (CONT'D). TEST 16-1 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 16
ENGINE MODEL 73 CHEV 454
ENGINE 8.0 L(454 CID) V-8
CVS NO. 4

TEST NO. 01 RUN
DATE 12/13/74
TIME 01:33
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 747.01 MM HG(29.41 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 47 PCT
ABSOLUTE HUMIDITY 8.2 GM/KG(57.7 GRAINS/LB)

NOX HUMIDITY C.F. .9248

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	48.9 (120.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8085	8315	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.6 (6484)	206.8 (7304)	219.5 (7576)	183.3 (6475)
HC SAMPLE METER/RANGE/PPM	81.3/ 2/ 81	57.6/ 2/ 58	16.3/ 3/ 163	52.4/ 2/ 52
HC BCKGRD METER/RANGE/PPM	13.9/ 2/ 14	13.8/ 2/ 14	1.3/ 3/ 13	12.0/ 2/ 12
CO SAMPLE METER/RANGE/PPM	86.7/12/ 210	65.6/11/ 268	61.9/ 2/ 3183	74.4/11/ 323
CO BCKGRD METER/RANGE/PPM	2.8/12/ 5	2.4/11/ 7	.7/ 2/ 27	14.7/11/ 45
CO2 SAMPLE METER/RANGE/PCT	23.3/ 3/ .38	39.4/ 3/ .67	79.8/ 3/ 1.47	25.1/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.2/ 3/ .05	3.6/ 3/ .06	4.0/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	13.4/ 2/ 13	33.7/ 2/ 34	94.7/ 2/ 95	14.3/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1	1.4/ 2/ 1	2.3/ 2/ 2	2.3/ 2/ 2
DILUTION FACTOR	32.94	19.19	7.50	30.03
HC CONCENTRATION PPM	68	95	152	91
CO CONCENTRATION PPM	201	254	3022	273
CO2 CONCENTRATION PCT	.33	.62	1.42	.35
NOX CONCENTRATION PPM	12.1	32.4	92.7	12.1
HC MASS GRAMS	7.18	5.31	18.77	4.31
CO MASS GRAMS	42.90	61.16	754.87	58.22
CO2 MASS GRAMS	1121.6	2348.6	5568.7	1175.1
NOX MASS GRAMS	3.94	11.84	35.18	3.92
FUEL KG (LB)	.382 (.84)	.776 (1.71)	2.148 (4.74)	.409 (.89)
KW HR (HP HR)	.68 (.92)	1.70 (2.28)	5.88 (7.88)	.68 (.92)
BSHC G/KW HR (G/HP HR)	10.50 (7.83)	3.13 (2.33)	3.19 (2.38)	6.31 (4.70)
BSCO G/KW HR (G/HP HR)	62.71 (46.76)	36.00 (26.85)	128.41 (95.76)	85.11 (63.47)
BSCO2 G/KW HR (G/HP HR)	1639.65 (1222.69)	1382.43 (1030.88)	947.32 (706.42)	1717.80 (1280.96)
BSNOX G/KW HR (G/HP HR)	5.76 (4.30)	6.97 (5.20)	5.98 (4.46)	5.73 (4.27)
BSFC KG/KW HR (LB/HP HR)	.558 (.918)	.457 (.751)	.365 (.601)	.540 (.970)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.95	(12.00)
BSHC G/KW HR (G/HP HR)	3.98	(2.97)
BSCO G/KW HR (G/HP HR)	102.53	(76.46)
BSCO2 G/KW HR (G/HP HR)	1142	(851)
BSNOX G/KW HR (G/HP HR)	6.13	(4.57)
BSFC KG/KW HR (LB/HP HR)	.915	(.682)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-3B. TEST 16-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 16
ENGINE MODEL 73 CHEV 454
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 9

TEST NO. 02 RUN
DATE 12/14/79
TIME
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 750.82 MM HG(29.56 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 46 PCT
ABSOLUTE HUMIDITY 7.5 GM/KG(52.4 GRAINS/LB)

NOX HUMIDITY C.F. .9041

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8086	8316	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.6 (6520)	207.9 (7344)	212.2 (7496)	184.3 (6511)
HC SAMPLE METER/RANGE/PPM	12.2/ 3/ 122	59.2/ 2/ 59	15.9/ 3/ 159	44.7/ 2/ 45
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	11.2/ 2/ 11	1.4/ 3/ 14	13.1/ 2/ 13
CO SAMPLE METER/RANGE/PPM	28.4/ 3/ 662	66.7/11/ 275	59.3/ 2/ 3001	61.2/11/ 243
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 5	3.5/11/ 10	.6/ 2/ 23	12.0/11/ 36
CO2 SAMPLE METER/RANGE/PCT	27.2/ 3/ .45	41.9/ 3/ .71	83.0/ 3/ 1.53	26.0/ 3/ .43
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.4/ 3/ .05	4.5/ 3/ .07	4.2/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	9.0/ 2/ 9	34.0/ 2/ 34	33.3/ 3/ 100	13.6/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.6/ 2/ 1	.5/ 3/ 2	1.9/ 2/ 2
DILUTION FACTOR	25.63	17.97	7.30	29.56
HC CONCENTRATION PPM	111	49	147	32
CO CONCENTRATION PPM	642	257	2849	203
CO2 CONCENTRATION PCT	.40	.66	1.47	.36
NOX CONCENTRATION PPM	8.7	33.4	98.6	11.8
HC MASS GRAMS	11.86	5.83	17.98	3.41
CO MASS GRAMS	138.02	62.27	704.01	43.48
CO2 MASS GRAMS	1363.9	2528.5	5722.2	1224.6
NOX MASS GRAMS	2.78	12.02	36.19	3.75
FUEL KG (LB)	.510 (1.12)	.834 (1.84)	2.171 (4.79)	.411 (.91)
KW HR (HP HR)	.66 (.89)	1.71 (2.29)	5.84 (7.83)	.66 (.89)
BSHC G/KW HR (G/HP HR)	17.93 (13.37)	3.42 (2.55)	3.08 (2.30)	5.15 (3.84)
BSCO G/KW HR (G/HP HR)	208.65 (155.59)	36.49 (27.21)	120.53 (89.88)	65.73 (49.02)
BSCO2 G/KW HR (G/HP HR)	2061.81 (1537.49)	1481.76 (1104.95)	979.69 (730.56)	1851.16 (1380.41)
BSNOX G/KW HR (G/HP HR)	4.20 (3.14)	7.05 (5.25)	6.20 (4.62)	5.67 (4.23)
BSFC KG/KW HR (LB/HP HR)	.771 (1.268)	.489 (.803)	.372 (.611)	.621 (1.021)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.87 (11.90)
BSHC G/KW HR (G/HP HR)	4.41 (3.29)
BSCO G/KW HR (G/HP HR)	106.85 (79.68)
BSCO2 G/KW HR (G/HP HR)	1222 (911)
BSNOX G/KW HR (G/HP HR)	6.17 (4.60)
BSFC KG/KW HR (LB/HP HR)	.493 (.728)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-3B (CONT'D). TEST 16-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 16
ENGINE MODEL 73 CHEV 454
ENGINE 0.0 L(-0 CID) V-8
CVS NO. 9

TEST NO. 02 RUN
DATE 12/14/79
TIME
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 750.82 MM HG(29.56 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 99 PCT
ABSOLUTE HUMIDITY 7.9 GM/KG(55.6 GRAINS/LB)

NOX HUMIDITY C.F. .9163

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8316	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.6 (6519)	207.4 (7344)	212.2 (7496)	184.3 (6511)
HC SAMPLE METER/RANGE/PPM	68.4/ 2/ 69	52.5/ 2/ 53	15.3/ 3/ 153	43.5/ 2/ 43
HC BCKGRD METER/RANGE/PPM	11.3/ 2/ 11	11.4/ 2/ 11	1.0/ 3/ 10	12.0/ 2/ 12
CO SAMPLE METER/RANGE/PPM	74.9/12/ 174	89.8/12/ 221	59.4/ 2/ 3043	98.3/12/ 250
CO BCKGRD METER/RANGE/PPM	1.8/12/ 3	2.3/12/ 4	.4/ 2/ 15	18.4/12/ 36
CO2 SAMPLE METER/RANGE/PCT	23.4/ 3/ .39	39.8/ 3/ .67	80.7/ 3/ 1.48	24.4/ 3/ .41
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.5/ 3/ .05	4.0/ 3/ .06	4.1/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	13.1/ 2/ 13	32.8/ 2/ 33	97.0/ 2/ 97	13.4/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	1.5/ 2/ 2	1.0/ 2/ 1	2.4/ 2/ 2	1.4/ 2/ 2
DILUTION FACTOR	32.50	19.12	7.48	30.83
HC CONCENTRATION PPM	58	42	144	32
CO CONCENTRATION PPM	166	210	2895	210
CO2 CONCENTRATION PCT	.34	.62	1.43	.34
NOX CONCENTRATION PPM	11.6	31.4	94.4	12.1
HC MASS GRAMS	6.17	5.00	17.67	3.39
CO MASS GRAMS	35.75	50.42	715.43	45.11
CO2 MASS GRAMS	1142.6	2373.1	5561.8	1164.6
NOX MASS GRAMS	3.77	11.61	35.31	3.40
FUEL KG (LB)	.386 (.85)	.778 (1.72)	2.125 (4.69)	.393 (.87)
KW HR (HP HR)	.66 (.89)	1.71 (2.29)	5.84 (7.83)	.66 (.89)
BSHC G/KW HR (G/HP HR)	9.33 (6.95)	2.93 (2.19)	3.02 (2.26)	5.13 (3.82)
BSCO G/KW HR (G/HP HR)	54.04 (40.30)	29.84 (22.25)	122.49 (91.34)	68.19 (50.85)
BSCO2 G/KW HR (G/HP HR)	1734.80 (1293.64)	1390.69 (1037.04)	952.23 (710.08)	1760.47 (1312.78)
BSNOX G/KW HR (G/HP HR)	5.70 (4.25)	6.80 (5.07)	6.05 (4.51)	5.89 (4.39)
BSFC KG/KW HR (LB/HP HR).	.583 (.958)	.456 (.750)	.364 (.598)	.594 (.976)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.87 (11.90)
BSHC G/KW HR (G/HP HR)	3.63 (2.71)
BSCO G/KW HR (G/HP HR)	95.51 (71.22)
BSCO2 G/KW HR (G/HP HR)	1155 (861)
BSNOX G/KW HR (G/HP HR)	6.15 (4.59)
BSFC KG/KW HR (LB/HP HR)	.415 (.682)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-4A. TEST 17-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 427
ENGINE MODEL 73 GMC 427
ENGINE 7.0 L(427 CID) V-8
CVS NO. 9

TEST NO. 17-2 RUN 1
DATE 10/24/79
TIME 09:01
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 744.47 MM HG(29.31 IN HG)
DRY BULB TEMP. 20.6 DEG C(69.0 DEG F)

RELATIVE HUMIDITY 49 PCT
ABSOLUTE HUMIDITY 7.5 GM/KG(52.8 GRAINS/LB)

NOX HUMIDITY C.F. .9057

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7299	8086	8318	7164
TIME SECONDS	277.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	186.3 (6582)	206.1 (7279)	210.4 (7430)	182.7 (6454)
HC SAMPLE METER/RANGE/PPM	33.9/ 3/ 339	17.8/ 3/ 178	24.5/ 3/ 245	10.1/ 3/ 101
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	1.4/ 3/ 14	1.3/ 3/ 13	1.5/ 3/ 15
CO SAMPLE METER/RANGE/PPM	39.0/ 3/ 928	26.4/ 3/ 613	63.3/ 3/ 1611	72.9/11/ 313
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.5/ 3/ 11	2.5/11/ 7
CO2 SAMPLE METER/RANGE/PCT	22.4/ 3/ .36	36.9/ 3/ .62	79.2/ 3/ 1.45	22.2/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.8/ 3/ .04	2.9/ 3/ .04	3.8/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	15.4/ 2/ 15	44.5/ 2/ 44	60.3/ 3/ 181	19.1/ 2/ 19
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.7/ 2/ 1	.2/ 3/ 1	1.4/ 2/ 1
DILUTION FACTOR	27.50	19.20	8.21	33.51
HC CONCENTRATION PPM	326	165	234	86
CO CONCENTRATION PPM	905	594	1530	299
CO2 CONCENTRATION PCT	.32	.58	1.41	.30
NOX CONCENTRATION PPM	14.7	43.8	180.4	17.7
HC MASS GRAMS	35.09	19.58	28.34	9.11
CO MASS GRAMS	196.40	142.54	374.85	63.67
CO2 MASS GRAMS	1086.5	2188.4	5448.2	1012.8
NOX MASS GRAMS	4.75	15.65	65.74	5.62
FUEL KG (LB)	.475 (1.05)	.780 (1.72)	1.932 (4.26)	.360 (.79)
KW HR (HP HR)	.74 (1.00)	1.80 (2.41)	5.85 (7.84)	.74 (1.00)
BSHC G/KW HR (G/HP HR)	47.15 (35.16)	10.90 (8.13)	4.85 (3.61)	12.24 (9.13)
BSCO G/KW HR (G/HP HR)	263.91 (196.80)	79.34 (59.15)	64.10 (47.80)	85.56 (63.80)
BSCO2 G/KW HR (G/HP HR)	1460.03 (1088.74)	1218.11 (908.34)	931.58 (694.68)	1360.89 (1014.81)
BSNOX G/KW HR (G/HP HR)	6.39 (4.76)	8.71 (6.50)	11.24 (8.38)	7.55 (5.63)
BSFC KG/KW HR (LB/HP HR)	.638 (1.049)	.434 (.714)	.330 (.543)	.484 (.795)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.13	(12.25)
BSHC G/KW HR (G/HP HR)	10.09	(7.52)
BSCO G/KW HR (G/HP HR)	85.12	(63.48)
BSCO2 G/KW HR (G/HP HR)	1065	(795)
BSNOX G/KW HR (G/HP HR)	10.05	(7.49)
BSFC KG/KW HR (LB/HP HR)	.388	(.638)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE D-4A (CONT'D). TEST 17-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 427
ENGINE MODEL 73 GMC 427
ENGINE 7.0 L(427 CID) V-8
CVS NO. 9

BAROMETER 744.73 MM HG(29.32 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

TEST NO. 17-2 RUN 1
DATE 10/24/79
TIME 09:42
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 8.4 GM/KG(59.1 GRAINS/LB)

NOX HUMIDITY C.F. .9303

BAG RESULTS

	1 NYNF	2 LANF	3 LANF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8087	8316	7162
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.0 (6463)	205.2 (7282)	210.4 (7431)	182.7 (6454)
HC SAMPLE METER/RANGE/PPM	14.8/ 3/ 148	14.0/ 3/ 140	21.9/ 3/ 219	13.5/ 3/ 135
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	1.3/ 3/ 13	1.4/ 3/ 14	1.4/ 3/ 14
CO SAMPLE METER/RANGE/PPM	82.4/11/ 380	86.6/11/ 413	57.6/ 3/ 1440	90.2/11/ 443
CO BCKGRD METER/RANGE/PPM	1.7/11/ 5	1.6/11/ 5	.2/ 3/ 5	1.5/11/ 4
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .35	35.9/ 3/ .60	78.6/ 3/ 1.44	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.7/ 3/ .04	3.3/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	18.1/ 2/ 18	47.7/ 2/ 48	60.1/ 3/ 180	18.4/ 2/ 18
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	.4/ 3/ 1	1.0/ 2/ 1
DILUTION FACTOR	33.72	20.42	8.37	32.89
HC CONCENTRATION PPM	135	128	207	121
CO CONCENTRATION PPM	367	397	1373	429
CO2 CONCENTRATION PCT	.30	.56	1.40	.30
NOX CONCENTRATION PPM	17.3	46.9	179.2	17.4
HC MASS GRAMS	14.29	15.18	25.08	12.80
CO MASS GRAMS	78.18	95.41	336.35	91.31
CO2 MASS GRAMS	1018.5	2125.4	5379.6	1009.4
NOX MASS GRAMS	5.64	17.22	67.11	5.67
FUEL KG (LB)	.374 (.82)	.732 (1.61)	1.888 (4.16)	.376 (.83)
KW HR (HP HR)	.77 (1.03)	1.82 (2.44)	5.83 (7.81)	.77 (1.04)
BSHC G/KW HR (G/HP HR)	18.64 (13.90)	8.34 (6.22)	4.30 (3.21)	16.53 (12.33)
BSCO G/KW HR (G/HP HR)	101.96 (76.03)	52.45 (39.11)	57.73 (43.05)	117.93 (87.94)
BSCO2 G/KW HR (G/HP HR)	1328.39 (990.58)	1168.34 (871.23)	923.42 (688.59)	1303.69 (972.16)
BSNOX G/KW HR (G/HP HR)	7.36 (5.49)	9.47 (7.06)	11.52 (8.59)	7.32 (5.46)
BSFC KG/KW HR (LB/HP HR)	.488 (.802)	.403 (.662)	.324 (.533)	.486 (.799)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.19 (	12.32)
BSHC G/KW HR (G/HP HR)	7.33 (	5.47)
BSCO G/KW HR (G/HP HR)	65.45 (	48.81)
BSCO2 G/KW HR (G/HP HR)	1038 (	774)
BSNOX G/KW HR (G/HP HR)	10.41 (	7.76)
BSFC KG/KW HR (LB/HP HR)	.367 (	.603)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	0.000 (	0.00)
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00 (	0.0)

TABLE D-4B. TEST 17-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 427
ENGINE MODEL 73 GMC 427
ENGINE 7.0 L(427 CID) V-8
CVS NO. 4

TEST NO. 17-3 RUN
DATE 10/25/79
TIME 08:31
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 744.22 MM HG(29.30 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 9.1 GM/KG(63.5 GRAINS/LB)

NOX HUMIDITY C.F. .9989

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8089	8321	7165
TIME SECONDS	271.9	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.9 (6460)	206.1 (7279)	210.4 (7430)	182.7 (6453)
HC SAMPLE METER/RANGE/PPM	33.3/ 3/ 333	17.9/ 3/ 179	23.2/ 3/ 232	13.6/ 3/ 136
HC BCKGRD METER/RANGE/PPM	1.2/ 3/ 12	1.3/ 3/ 13	1.4/ 3/ 14	1.4/ 3/ 14
CO SAMPLE METER/RANGE/PPM	38.3/ 3/ 910	25.5/ 3/ 591	63.0/ 3/ 1601	90.5/11/ 996
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.2/ 3/ 5	.2/ 3/ 5	2.6/11/ 8
CO2 SAMPLE METER/RANGE/PCT	23.2/ 3/ .38	37.2/ 3/ .63	80.6/ 3/ 1.48	22.0/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.5/ 3/ .05	3.4/ 3/ .06	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	15.7/ 2/ 16	48.1/ 2/ 98	61.5/ 3/ 189	18.1/ 2/ 18
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.7/ 2/ 1	.1/ 3/ 0	.9/ 2/ 1
DILUTION FACTOR	26.87	19.11	8.08	32.45
HC CONCENTRATION PPM	321	167	220	122
CO CONCENTRATION PPM	887	571	1526	928
CO2 CONCENTRATION PCT	.33	.58	1.43	.30
NOX CONCENTRATION PPM	15.1	47.4	189.2	17.2
HC MASS GRAMS	33.91	19.81	26.66	12.90
CO MASS GRAMS	188.93	136.91	373.84	91.15
CO2 MASS GRAMS	1092.8	2170.6	5508.0	1011.3
NOX MASS GRAMS	5.02	17.74	70.35	5.71
FUEL KG (LB)	.472 (1.04)	.772 (1.70)	1.948 (4.30)	.377 (.83)
KW HR (HP HR)	.75 (1.01)	1.83 (2.45)	5.93 (7.95)	.79 (1.06)
BSHC G/KW HR (G/HP HR)	45.11 (33.64)	10.85 (8.09)	4.50 (3.35)	16.34 (12.19)
BSCO G/KW HR (G/HP HR)	251.34 (187.42)	74.95 (55.89)	63.03 (47.00)	115.48 (86.11)
BSCO2 G/KW HR (G/HP HR)	1453.81 (1084.11)	1188.30 (886.12)	928.68 (692.52)	1281.28 (955.45)
BSNOX G/KW HR (G/HP HR)	6.68 (4.98)	9.71 (7.24)	11.86 (8.85)	7.24 (5.40)
BSFC KG/KW HR (LB/HP HR)	.628 (1.032)	.423 (.695)	.328 (.540)	.477 (.785)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.30 (12.47)
BSHC G/KW HR (G/HP HR)	10.03 (7.48)
BSCO G/KW HR (G/HP HR)	85.05 (63.42)
BSCO2 G/KW HR (G/HP HR)	1052 (785)
BSNOX G/KW HR (G/HP HR)	10.63 (7.93)
BSFC KG/KW HR (LB/HP HR)	.389 (.631)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-4B (CONT'D). TEST 17-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO. 427
ENGINE MODEL 73 GMC 427
ENGINE 7.0 L(427 CID) V-8
CVS NO. 9

TEST NO. 17-3 RUN
DATE 10/25/79
TIME 09:11
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 744.22 MM HG(29.30 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.3 GRAINS/LB)

NOX HUMIDITY C.F. .9693

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8087	8318	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.9 (6459)	206.0 (7277)	210.3 (7428)	182.6 (6451)
HC SAMPLE METER/RANGE/PPM	17.5/ 3/ 175	16.6/ 3/ 166	22.7/ 3/ 227	13.7/ 3/ 137
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14	1.4/ 3/ 14	1.5/ 3/ 15	1.5/ 3/ 15
CO SAMPLE METER/RANGE/PPM	83.7/11/ 390	90.4/11/ 445	57.8/ 3/ 1446	84.4/11/ 396
CO BCKGRD METER/RANGE/PPM	1.4/11/ 4	1.7/11/ 5	.1/ 3/ 2	2.0/11/ 6
CO2 SAMPLE METER/RANGE/PCT	21.5/ 3/ .35	36.3/ 3/ .61	79.5/ 3/ 1.46	21.0/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.1/ 3/ .05	3.6/ 3/ .06	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	17.9/ 2/ 18	48.1/ 2/ 48	65.6/ 3/ 197	17.5/ 2/ 18
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.7/ 2/ 1	.3/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	33.27	20.02	8.27	34.27
HC CONCENTRATION PPM	161	153	214	122
CO CONCENTRATION PPM	377	428	1380	381
CO2 CONCENTRATION PCT	.30	.56	1.41	.29
NOX CONCENTRATION PPM	17.2	47.4	196.0	16.7
HC MASS GRAMS	17.03	18.15	25.93	12.90
CO MASS GRAMS	80.37	102.69	337.87	81.05
CO2 MASS GRAMS	1013.7	2129.5	5433.3	963.6
NOX MASS GRAMS	5.84	18.12	76.43	5.66
FUEL KG (LB)	.376 (.83)	.740 (1.63)	1.906 (4.20)	.357 (.79)
KW HR (HP HR)	.75 (1.01)	1.83 (2.45)	5.89 (7.90)	.78 (1.05)
BSHC G/KW HR (G/HP HR)	22.65 (16.89)	9.93 (7.41)	4.40 (3.28)	16.50 (12.30)
BSCO G/KW HR (G/HP HR)	106.91 (79.73)	56.22 (41.92)	57.33 (42.75)	103.67 (77.31)
BSCO2 G/KW HR (G/HP HR)	1348.54 (1005.60)	1165.78 (869.32)	921.93 (687.48)	1232.52 (919.09)
BSNOX G/KW HR (G/HP HR)	7.77 (5.79)	9.92 (7.40)	12.97 (9.67)	7.24 (5.40)
BSFC KG/KW HR (LB/HP HR)	.501 (.823)	.405 (.666)	.323 (.532)	.456 (.750)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.25 (12.41)
BSHC G/KW HR (G/HP HR)	8.00 (5.96)
BSCO G/KW HR (G/HP HR)	65.05 (48.51)
BSCO2 G/KW HR (G/HP HR)	1031 (769)
BSNOX G/KW HR (G/HP HR)	11.46 (8.55)
BSFC KG/KW HR (LB/HP HR)	.365 (.600)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-5A. TEST 18-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 72 CHEV 350
ENGINE 5.7 L(350 CID) V-8
CVS NO. 9

TEST NO.18-1 RUN
DATE 11/14/79
TIME 09:25
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 751.33 MM HG(29.58 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 8.3 GM/KG(58.2 GRAINS/LB)

NOX HUMIDITY C.F. .9267

BAG RESULTS	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8317	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.7 (6524)	208.1 (7349)	212.4 (7502)	184.5 (6516)
HC SAMPLE METER/RANGE/PPM	24.7/ 3/ 247	12.9/ 3/ 129	12.0/ 3/ 120	18.0/ 3/ 180
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	1.3/ 3/ 13	1.3/ 3/ 13	1.4/ 3/ 14
CO SAMPLE METER/RANGE/PPM	45.5/ 3/ 1100	32.0/ 3/ 751	45.9/ 3/ 1111	45.9/11/ 445
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.2/ 3/ 5	.2/ 3/ 5	1.5/11/ 9
CO2 SAMPLE METER/RANGE/PCT	16.7/ 3/ .27	26.8/ 3/ .44	67.3/ 3/ 1.21	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.2/ 3/ .03	2.1/ 3/ .03	2.4/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	7.7/ 2/ 8	29.7/ 2/ 30	93.4/ 3/ 130	14.5/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.1/ 3/ 0	.7/ 2/ 1
DILUTION FACTOR	33.63	25.52	10.09	30.10
HC CONCENTRATION PPM	234	117	108	166
CO CONCENTRATION PPM	1074	728	1063	480
CO2 CONCENTRATION PCT	.23	.41	1.18	.23
NOX CONCENTRATION PPM	7.6	29.6	129.9	13.8
HC MASS GRAMS	24.97	13.98	13.27	17.70
CO MASS GRAMS	231.02	176.36	262.84	103.17
CO2 MASS GRAMS	789.8	1555.8	4575.9	788.9
NOX MASS GRAMS	2.49	10.92	48.92	4.52
FUEL KG (LB)	.388 (.86)	.592 (1.30)	1.586 (3.50)	.318 (.70)
KW HR (HP HR)	.71 (.95)	1.50 (2.01)	5.13 (6.88)	.67 (.90)
BSHC G/KW HR (G/HP HR)	35.34 (26.35)	9.35 (6.97)	2.59 (1.93)	26.46 (19.73)
BSCO G/KW HR (G/HP HR)	326.95 (243.80)	117.89 (87.91)	51.27 (38.23)	154.21 (114.99)
BSCO2 G/KW HR (G/HP HR)	1117.73 (833.49)	1040.03 (775.55)	892.56 (665.59)	1179.17 (879.31)
BSNOX G/KW HR (G/HP HR)	3.52 (2.63)	7.30 (5.44)	9.59 (7.12)	6.75 (5.04)
BSFC KG/KW HR (LB/HP HR)	.550 (.904)	.396 (.650)	.309 (.509)	.475 (.780)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.00	(10.73)
BSHC G/KW HR (G/HP HR)	8.74	(6.52)
BSCO G/KW HR (G/HP HR)	96.70	(72.11)
BSCO2 G/KW HR (G/HP HR)	964	(719)
BSNOX G/KW HR (G/HP HR)	8.36	(6.23)
BSFC KG/KW HR (LB/HP HR)	.361	(.593)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE D-5A (CONT'D). TEST 18-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 73 CHEVY
ENGINE 5.7 L(350 CID) V-8
CVS NO. 9

TEST NO.18-2 RUN
DATE 11/16/79
TIME 10:27
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 749.81 MM HG(29.52 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 50 PCT
ABSOLUTE HUMIDITY 8.2 GM/KG(57.1 GRAINS/LB) NOX HUMIDITY C.F. .9226

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8318	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.3 (6510)	207.6 (7334)	212.0 (7487)	184.1 (6502)
HC SAMPLE METER/RANGE/PPM	75.4/ 2/ 75	91.3/ 2/ 91	15.9/ 3/ 159	63.7/ 2/ 64
HC BCKGRD METER/RANGE/PPM	15.0/ 2/ 15	14.9/ 2/ 15	1.5/ 3/ 15	13.0/ 2/ 13
CO SAMPLE METER/RANGE/PPM	90.0/11/ 440	25.3/ 3/ 735	76.6/ 3/ 2176	98.1/11/ 516
CO BCKGRD METER/RANGE/PPM	.7/11/ 2	.1/ 3/ 3	.3/ 3/ 9	2.7/11/ 8
CO2 SAMPLE METER/RANGE/PCT	16.6/ 3/ .26	27.5/ 3/ .44	69.6/ 3/ 1.13	16.3/ 3/ .25
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	3.3/ 3/ .05	2.9/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	15.1/ 2/ 15	36.2/ 2/ 36	40.5/ 3/ 121	14.1/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	1.0/ 2/ 1	1.2/ 2/ 1	.3/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	43.82	25.86	9.89	43.61
HC CONCENTRATION PPM	61	77	196	51
CO CONCENTRATION PPM	429	714	2086	498
CO2 CONCENTRATION PCT	.22	.39	1.09	.21
NOX CONCENTRATION PPM	14.1	35.0	120.7	13.3
HC MASS GRAMS	6.46	9.22	17.79	5.41
CO MASS GRAMS	91.97	172.75	519.86	106.77
CO2 MASS GRAMS	740.6	1485.4	4236.2	694.1
NOX MASS GRAMS	4.59	12.84	45.15	4.33
FUEL KG (LB)	.285 (.63)	.563 (1.24)	1.608 (3.55)	.277 (.61)
KW HR (HP HR)	.68 (.91)	1.53 (2.05)	5.23 (7.02)	.67 (.90)
BSHC G/KW HR (G/HP HR)	9.54 (7.12)	6.04 (4.50)	3.40 (2.54)	8.09 (6.04)
BSCO G/KW HR (G/HP HR)	135.94 (101.37)	113.21 (84.42)	98.41 (73.38)	159.60 (119.01)
BSCO2 G/KW HR (G/HP HR)	1094.64 (816.27)	973.43 (725.89)	809.68 (603.78)	1037.42 (773.60)
BSNOX G/KW HR (G/HP HR)	6.79 (5.06)	8.42 (6.28)	8.63 (6.44)	6.47 (4.82)
BSFC KG/KW HR (LB/HP HR)	.422 (.694)	.369 (.607)	.307 (.505)	.414 (.681)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.10	(10.87)
BSHC G/KW HR (G/HP HR)	4.80	(3.58)
BSCO G/KW HR (G/HP HR)	109.38	(81.56)
BSCO2 G/KW HR (G/HP HR)	883	(659)
BSNOX G/KW HR (G/HP HR)	8.26	(6.16)
BSFC KG/KW HR (LB/HP HR)	.337	(.555)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-5B. TEST 18-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 72 CHEV 350
ENGINE 5.7 L(350 CID) V-8
CVS NO. 9

TEST NO.18-3 RUN
DATE 11/20/79
TIME 08149
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 741.68 MM HG(29.20 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 68 PCT
ABSOLUTE HUMIDITY 12.5 GM/KG(87.5 GRAINS/LB)

NOX HUMIDITY C.F. 1.0626

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8088	8319	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.3 (6437)	205.3 (7252)	209.6 (7401)	182.0 (6428)
HC SAMPLE METER/RANGE/PPM	21.9/ 3/ 219	13.7/ 3/ 137	16.0/ 3/ 160	68.3/ 2/ 68
HC BCKGRD METER/RANGE/PPM	1.8/ 3/ 18	1.9/ 3/ 19	2.0/ 3/ 20	18.7/ 2/ 19
CO SAMPLE METER/RANGE/PPM	48.5/ 3/ 1182	30.3/ 3/ 709	75.2/ 3/ 1994	23.5/ 3/ 543
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.1/ 3/ 2	.1/ 3/ 2
CO2 SAMPLE METER/RANGE/PCT	15.7/ 3/ .25	26.8/ 3/ .44	63.4/ 3/ 1.13	16.6/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.9/ 3/ .04	3.3/ 3/ .05	3.3/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	7.6/ 2/ 8	30.5/ 2/ 30	37.3/ 3/ 112	13.3/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.4/ 2/ 0	.4/ 2/ 0	.1/ 3/ 0	.5/ 2/ 1
DILUTION FACTOR	34.69	25.70	10.02	41.35
HC CONCENTRATION PPM	202	119	142	50
CO CONCENTRATION PPM	1148	685	1905	526
CO2 CONCENTRATION PCT	.21	.40	1.09	.22
NOX CONCENTRATION PPM	7.2	30.1	111.6	12.8
HC MASS GRAMS	21.18	14.06	17.16	5.25
CO MASS GRAMS	243.61	163.76	469.82	111.56
CO2 MASS GRAMS	703.7	1490.5	4165.1	716.9
NOX MASS GRAMS	2.67	12.57	47.55	4.74
FUEL KG (LB)	.364 (.80)	.565 (1.25)	1.560 (3.44)	.287 (.63)
KW HR (HP HR)	.64 (.86)	1.46 (1.96)	5.10 (6.83)	.65 (.88)
BSHC G/KW HR (G/HP HR)	33.15 (24.72)	9.64 (7.19)	3.37 (2.51)	8.03 (5.99)
BSCO G/KW HR (G/HP HR)	381.26 (284.31)	112.29 (83.74)	91.20 (68.01)	170.59 (127.21)
BSCO2 G/KW HR (G/HP HR)	1101.37 (821.29)	1022.09 (762.17)	817.23 (609.41)	1096.25 (817.47)
BSNOX G/KW HR (G/HP HR)	4.18 (3.12)	8.62 (6.43)	9.33 (6.96)	7.25 (5.40)
BSFC KG/KW HR (LB/HP HR)	.569 (.936)	.387 (.637)	.306 (.503)	.438 (.720)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.85 (10.52)
BSHC G/KW HR (G/HP HR)	7.35 (5.48)
BSCO G/KW HR (G/HP HR)	125.35 (93.48)
BSCO2 G/KW HR (G/HP HR)	902 (672)
BSNOX G/KW HR (G/HP HR)	8.60 (6.42)
BSFC KG/KW HR (LB/HP HR)	.354 (.581)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-5B (CONT'D). TEST 18-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.C 350
ENGINE MODEL 72 CHEV 350
ENGINE 5.7 L(350 CID) V-8
CVS NO. 9

TEST NO.18-3 RUN
DATE 11/20/79
TIME 09:29
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 741.68 MM HG(29.20 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 65 PCT
ABSOLUTE HUMIDITY 11.9 GM/KG(83.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0421

BAG RESULTS	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8317	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.2 (6435)	205.3 (7250)	209.5 (7400)	182.0 (6428)
HC SAMPLE METER/RANGE/PPM	71.2/ 2/ 71	82.7/ 2/ 83	15.7/ 3/ 157	7.2/ 3/ 72
HC BCKGRD METER/RANGE/PPM	20.0/ 2/ 20	19.4/ 2/ 19	2.1/ 3/ 21	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	92.8/11/ 466	26.8/ 3/ 623	76.3/ 3/ 2031	25.2/ 3/ 584
CO BCKGRD METER/RANGE/PPM	.2/11/ 1	.1/ 3/ 2	.1/ 3/ 2	.2/ 3/ 5
CO2 SAMPLE METER/RANGE/PCT	16.3/ 3/ .26	27.1/ 3/ .44	63.3/ 3/ 1.13	16.4/ 3/ .26
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	13.3/ 2/ 13	33.6/ 2/ 34	35.7/ 3/ 107	13.9/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.8/ 2/ 1	.8/ 2/ 1	.2/ 3/ 1	1.1/ 2/ 1
DILUTION FACTOR	42.96	26.12	10.01	41.21
HC CONCENTRATION PPM	52	64	138	55
CO CONCENTRATION PPM	454	602	1943	565
CO2 CONCENTRATION PCT	.22	.40	1.09	.21
NOX CONCENTRATION PPM	12.5	32.8	106.6	12.8
HC MASS GRAMS	5.43	7.58	16.69	5.82
CO MASS GRAMS	96.25	143.97	473.95	119.65
CO2 MASS GRAMS	736.1	1515.4	4193.7	715.8
NOX MASS GRAMS	4.55	13.43	44.50	4.65
FUEL KG (LB)	.285 (.63)	.557 (1.23)	1.574 (3.47)	.291 (.64)
KW HR (HP HR)	.64 (.86)	1.50 (2.02)	5.10 (6.83)	.65 (.88)
BSHC G/KW HR (G/HP HR)	8.50 (6.34)	5.04 (3.76)	3.27 (2.44)	8.89 (6.63)
BSCO G/KW HR (G/HP HR)	150.63 (112.33)	95.76 (71.41)	92.99 (69.34)	182.95 (136.42)
BSCO2 G/KW HR (G/HP HR)	1152.00 (859.05)	1007.99 (751.66)	822.85 (613.60)	1094.50 (816.17)
BSNOX G/KW HR (G/HP HR)	7.12 (5.31)	8.94 (6.66)	8.73 (6.51)	7.11 (5.31)
BSFC KG/KW HR (LB/HP HR)	.446 (.734)	.370 (.609)	.309 (.508)	.445 (.731)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.89	(10.58)
BSHC G/KW HR (G/HP HR)	4.50	(3.36)
BSCO G/KW HR (G/HP HR)	105.64	(78.78)
BSCO2 G/KW HR (G/HP HR)	907	(677)
BSNOX G/KW HR (G/HP HR)	8.51	(6.34)
BSFC KG/KW HR (LB/HP HR)	.343	(.564)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE D-6A. TEST 19-2 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 IHC 345
ENGINE 5.7 L(345 CID)
CVS NO. 9

TEST NO.19-2 RUN
DATE 2/ 8/80
TIME 09:00
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.89 MM HG(29.09 IN HG)
DRY BULB TEMP. 22.8 DEG C(73.0 DEG F)

RELATIVE HUMIDITY 61 PCT
ABSOLUTE HUMIDITY 10.9 GM/KG(76.0 GRAINS/LB)

NOX HUMIDITY C.F. 1.0048

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7176	8098	8334	7175
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.8 (6420)	204.8 (7232)	209.1 (7385)	181.6 (6413)
HC SAMPLE METER/RANGE/PPM	35.7/ 3/ 357	15.3/ 3/ 153	21.6/ 3/ 216	8.7/ 3/ 87
HC BCKGRD METER/RANGE/PPM	2.6/ 3/ 26	2.2/ 3/ 22	2.0/ 3/ 20	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	31.4/ 3/ 912	34.8/ 3/ 1010	56.5/ 2/ 3630	22.2/ 3/ 645
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 20	.4/ 3/ 11	.3/ 2/ 18	.1/ 3/ 3
CO2 SAMPLE METER/RANGE/PCT	21.4/ 3/ .33	30.8/ 3/ .49	64.4/ 3/ 1.13	17.6/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	3.5/ 3/ .05	3.4/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.7/ 2/ 13	31.6/ 2/ 32	95.7/ 2/ 96	12.0/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.3/ 2/ 0	.9/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	29.22	22.05	8.96	39.06
HC CONCENTRATION PPM	332	132	198	70
CO CONCENTRATION PPM	869	970	3464	626
CO2 CONCENTRATION PCT	.29	.45	1.08	.23
NOX CONCENTRATION PPM	12.1	31.3	94.9	11.3
HC MASS GRAMS	34.79	15.59	23.91	7.38
CO MASS GRAMS	184.02	231.31	843.55	132.37
CO2 MASS GRAMS	965.6	1669.8	4139.8	750.3
NOX MASS GRAMS	4.23	12.32	38.14	3.95
FUEL KG (LB)	.430 (.95)	.657 (1.45)	1.747 (3.85)	.309 (.68)
KW HR (HP HR)	.71 (.95)	1.68 (2.26)	5.51 (7.39)	.74 (1.00)
BSHC G/KW HR (G/HP HR)	49.24 (36.72)	9.26 (6.90)	4.34 (3.24)	9.91 (7.39)
BSCO G/KW HR (G/HP HR)	260.43 (194.20)	137.37 (102.44)	153.09 (114.16)	177.87 (132.64)
BSCO2 G/KW HR (G/HP HR)	1366.47 (1018.98)	991.67 (739.49)	751.32 (560.26)	1008.21 (751.83)
BSNOX G/KW HR (G/HP HR)	5.99 (4.47)	7.32 (5.46)	6.92 (5.16)	5.31 (3.96)
BSFC KG/KW HR (LB/HP HR)	.609 (1.001)	.390 (.641)	.317 (.521)	.416 (.684)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.64	(11.59)
BSHC G/KW HR (G/HP HR)	9.45	(7.04)
BSCO G/KW HR (G/HP HR)	160.94	(120.01)
BSCO2 G/KW HR (G/HP HR)	871	(649)
BSNOX G/KW HR (G/HP HR)	6.78	(5.06)
BSFC KG/KW HR (LB/HP HR)	.364	(.598)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-6A (CONT'D). TEST 19-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 IHC 345
ENGINE 5.7 L(345 CID)
CVS NO. 9

TEST NO.19-2 RUN
DATE 2/ 8/80
TIME 09:45
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 738.89 MM HG(29.09 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 60 PCT
ABSOLUTE HUMIDITY 10.3 GM/KG(72.2 GRAINS/LB)

NOX HUMIDITY C.F. .9871

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7177	8101	8335	7176
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.8 (6421)	204.8 (7235)	209.1 (7386)	181.6 (6414)
HC SAMPLE METER/RANGE/PPM	9.9/ 3/ 99	12.3/ 3/ 123	22.9/ 3/ 229	64.3/ 2/ 64
HC BCKGRD METER/RANGE/PPM	1.9/ 3/ 19	2.0/ 3/ 20	2.2/ 3/ 22	18.6/ 2/ 19
CO SAMPLE METER/RANGE/PPM	18.5/ 3/ 537	31.0/ 3/ 901	61.3/ 2/ 3941	21.1/ 3/ 613
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 26	.7/ 3/ 20	.6/ 2/ 36	.3/ 3/ 9
CO2 SAMPLE METER/RANGE/PCT	18.6/ 3/ .29	29.1/ 3/ .46	65.3/ 3/ 1.14	19.6/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	3.0/ 3/ .04	3.4/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.7/ 2/ 13	33.4/ 2/ 33	97.3/ 2/ 97	12.7/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.4/ 2/ 0	.5/ 2/ 1	.6/ 2/ 1
DILUTION FACTOR	38.28	23.73	8.68	36.18
HC CONCENTRATION PPM	80	104	210	46
CO CONCENTRATION PPM	499	856	3747	589
CO2 CONCENTRATION PCT	.25	.42	1.10	.26
NOX CONCENTRATION PPM	12.4	33.0	96.9	12.1
HC MASS GRAMS	8.44	12.27	25.27	4.84
CO MASS GRAMS	105.61	204.26	912.53	124.58
CO2 MASS GRAMS	820.1	1585.6	4210.1	859.7
NOX MASS GRAMS	4.26	12.77	38.25	4.15
FUEL KG (LB)	.319 (.70)	.613 (1.35)	1.805 (3.98)	.338 (.74)
KW HR (HP HR)	.74 (.99)	1.68 (2.25)	5.51 (7.39)	.75 (1.01)
BSHC G/KW HR (G/HP HR)	11.46 (8.54)	7.32 (5.46)	4.59 (3.42)	6.44 (4.80)
BSCO G/KW HR (G/HP HR)	143.36 (106.90)	121.85 (90.86)	165.61 (123.50)	165.73 (123.59)
BSCO2 G/KW HR (G/HP HR)	1113.28 (830.17)	945.85 (705.32)	764.08 (569.78)	1143.69 (852.85)
BSNOX G/KW HR (G/HP HR)	5.78 (4.31)	7.62 (5.68)	6.94 (5.18)	5.53 (4.12)
BSFC KG/KW HR (LB/HP HR)	.433 (.713)	.366 (.601)	.327 (.538)	.449 (.738)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.67 (11.63)
BSHC G/KW HR (G/HP HR)	5.86 (4.37)
BSCO G/KW HR (G/HP HR)	155.28 (115.79)
BSCO2 G/KW HR (G/HP HR)	862 (643)
BSNOX G/KW HR (G/HP HR)	6.85 (5.11)
BSFC KG/KW HR (LB/HP HR)	.354 (.583)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-6B. TEST 19-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 IHC 345
ENGINE 5.7 L(345 CID)
CVS NO. 9

TEST NO.19-3 RUN
DATE 2/13/80
TIME 08:30
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 245.49 MM HG(29.35 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 51 PCT
ABSOLUTE HUMIDITY 8.7 GM/KG(60.7 GRAINS/LB)

NOX HUMIDITY C.F. .9370

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7178	8101	8336	7177
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	193.5 (6482)	206.8 (7303)	211.1 (7457)	183.3 (6475)
HC SAMPLE METER/RANGE/PPM	39.6/ 3/ 396	16.0/ 3/ 160	21.5/ 3/ 215	71.6/ 2/ 72
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.2/ 3/ 12	1.2/ 3/ 12	10.6/ 2/ 11
CO SAMPLE METER/RANGE/PPM	38.2/ 3/ 908	36.7/ 3/ 869	65.8/ 2/ 3467	27.6/ 3/ 642
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.2/ 2/ 8	.7/ 3/ 16
CO2 SAMPLE METER/RANGE/PCT	19.5/ 3/ .31	28.5/ 3/ .47	61.6/ 3/ 1.09	17.0/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04	2.7/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	11.4/ 2/ 11	32.7/ 2/ 33	94.1/ 2/ 94	12.7/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.7/ 2/ 1	.9/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	30.35	23.52	9.24	39.29
HC CONCENTRATION PPM	385	149	204	61
CO CONCENTRATION PPM	885	845	3330	613
CO2 CONCENTRATION PCT	.27	.43	1.06	.23
NOX CONCENTRATION PPM	10.8	32.0	93.3	11.9
HC MASS GRAMS	40.79	17.71	24.88	6.48
CO MASS GRAMS	189.19	203.46	818.73	130.92
CO2 MASS GRAMS	908.3	1620.7	4085.6	775.1
NOX MASS GRAMS	3.56	11.87	35.31	3.92
FUEL KG (LB)	.421 (.93)	.629 (1.39)	1.718 (3.79)	.316 (.70)
KW HR (HP HR)	.71 (.95)	1.70 (2.28)	5.61 (7.52)	.73 (.98)
BSHC G/KW HR (G/HP HR)	57.73 (43.05)	10.42 (7.77)	4.44 (3.31)	8.89 (6.63)
BSCO G/KW HR (G/HP HR)	267.74 (199.65)	119.76 (89.31)	146.00 (108.87)	179.55 (133.89)
BSCO2 G/KW HR (G/HP HR)	1285.45 (958.56)	953.99 (711.39)	728.56 (543.29)	1063.01 (792.68)
BSNOX G/KW HR (G/HP HR)	5.04 (3.76)	6.99 (5.21)	6.30 (4.69)	5.37 (4.01)
BSFC KG/KW HR (LB/HP HR)	.596 (.979)	.370 (.609)	.306 (.504)	.433 (.712)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.74 (11.72)
BSHC G/KW HR (G/HP HR)	10.28 (7.66)
BSCO G/KW HR (G/HP HR)	153.54 (114.49)
BSCO2 G/KW HR (G/HP HR)	845 (630)
BSNOX G/KW HR (G/HP HR)	6.25 (4.66)
BSFC KG/KW HR (LB/HP HR)	.393 (.580)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-6B (CONT'D). TEST 19-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.
ENGINE MODEL 72 IHC 345
ENGINE 5.7 L(345 CID)
CVS NO. 9

TEST NO.19-3 RUN
DATE 2/13/80
TIME 09:10
DYNO NO. 2

GASOLINE EM-262-F
BAG CART NO. 1

BAROMETER 745.49 MM HG(29.35 IN HG)
DRY BULB TEMP. 23.3 DEG C(74.0 DEG F)

RELATIVE HUMIDITY 43 PCT
ABSOLUTE HUMIDITY 7.8 GM/KG(54.9 GRAINS/LB)

NOX HUMIDITY C.F. .9137

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7177	8100	8336	7177
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.5 (6481)	206.7 (7302)	211.1 (7457)	183.3 (6475)
HC SAMPLE METER/RANGE/PPM	72.9/ 2/ 73	11.9/ 3/ 119	21.6/ 3/ 216	20.2/ 2/ 20
HC BCKGRD METER/RANGE/PPM	10.5/ 2/ 10	1.1/ 3/ 11	1.1/ 3/ 11	11.4/ 2/ 11
CO SAMPLE METER/RANGE/PPM	92.5/11/ 964	36.9/ 3/ 874	66.4/ 2/ 3512	26.7/ 3/ 620
CO BCKGRD METER/RANGE/PPM	1.7/11/ 5	.2/ 3/ 5	.2/ 2/ 8	.7/ 3/ 16
CO2 SAMPLE METER/RANGE/PCT	12.4/ 3/ .28	27.7/ 3/ .45	61.2/ 3/ 1.09	16.9/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.6/ 3/ .04	2.7/ 3/ .04	2.4/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	12.6/ 2/ 13	33.5/ 2/ 33	94.6/ 2/ 95	12.6/ 2/ 13
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1	.4/ 2/ 0	.9/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	40.54	24.26	9.26	39.73
HC CONCENTRATION PPM	63	108	206	59
CO CONCENTRATION PPM	450	850	3382	593
CO2 CONCENTRATION PCT	.24	.42	1.05	.23
NOX CONCENTRATION PPM	11.9	33.1	93.8	11.5
HC MASS GRAMS	6.63	12.93	25.11	6.25
CO MASS GRAMS	96.13	204.71	831.64	126.67
CO2 MASS GRAMS	803.2	1578.0	4060.0	784.6
NOX MASS GRAMS	3.82	11.97	34.62	3.69
FUEL KG (LB)	.307 (.68)	.612 (1.35)	1.717 (3.79)	.316 (.70)
KW HR (HP HR)	.71 (.95)	1.71 (2.29)	5.61 (7.52)	.74 (.99)
BSHC G/KW HR (G/HP HR)	9.39 (7.00)	7.58 (5.65)	4.48 (3.34)	8.48 (6.32)
BSCO G/KW HR (G/HP HR)	136.05 (101.45)	119.97 (89.46)	148.30 (110.59)	171.95 (128.23)
BSCO2 G/KW HR (G/HP HR)	1136.76 (847.68)	924.76 (689.59)	724.00 (539.89)	1065.01 (794.18)
BSNOX G/KW HR (G/HP HR)	5.41 (4.03)	7.01 (5.23)	6.17 (4.60)	5.01 (3.74)
BSFC KG/KW HR (LB/HP HR)	.435 (.715)	.359 (.589)	.306 (.503)	.429 (.706)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.76 (	11.74)
BSHC G/KW HR (G/HP HR)	5.81 (	4.34)
BSCO G/KW HR (G/HP HR)	143.28 (	107.22)
BSCO2 G/KW HR (G/HP HR)	825 (	615)
BSNOX G/KW HR (G/HP HR)	6.18 (	4.61)
BSFC KG/KW HR (LB/HP HR)	.337 (	.554)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-7A. TEST 20-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.FORD
ENGINE MODEL 72 FORD 300
ENGINE 4.9 L(=0 CID) I-6
CVS NO. 9

TEST NO.20-3 RUN
DATE 1/17/80
TIME 09:00 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

BAROMETER 740.66 MM HG(29.16 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 53 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.1 GRAINS/LB) — NOX HUMIDITY C.F. .9514

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8087	8321	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.0 (6427)	205.0 (7240)	209.3 (7392)	181.8 (6420)
HC SAMPLE METER/RANGE/PPM	45.5/ 3/ 455	16.1/ 3/ 161	13.5/ 3/ 135	11.4/ 3/ 114
HC BCKGRD METER/RANGE/PPM	1.0/ 3/ 10	1.1/ 3/ 11	1.2/ 3/ 12	1.3/ 3/ 13
CO SAMPLE METER/RANGE/PPM	31.0/ 3/ 726	23.3/ 3/ 538	56.2/ 3/ 1349	88.3/11/ 427
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.1/ 3/ 2	.8/11/ 2
CO2 SAMPLE METER/RANGE/PCT	16.8/ 3/ .27	24.0/ 3/ .39	51.6/ 3/ .90	14.4/ 3/ .23
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	3.0/ 3/ .05	2.6/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	11.6/ 2/ 12	36.4/ 2/ 36	37.8/ 3/ 113	15.7/ 2/ 16
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.3/ 2/ 1	.2/ 3/ 1	1.2/ 2/ 1
DILUTION FACTOR	34.88	29.20	12.80	42.67
HC CONCENTRATION PPM	445	150	124	101
CO CONCENTRATION PPM	707	523	1349	416
CO2 CONCENTRATION PCT	.22	.35	.86	.19
NOX CONCENTRATION PPM	10.5	35.1	112.8	14.5
HC MASS GRAMS	46.73	17.78	14.96	10.62
CO MASS GRAMS	149.91	124.83	328.67	87.99
CO2 MASS GRAMS	738.6	1298.5	3301.8	619.2
NOX MASS GRAMS	3.49	13.11	42.98	4.81
FUEL KG (LB)	.354 (.78)	.489 (1.08)	1.219 (2.69)	.249 (.55)
KW HR (HP HR)	.61 (.82)	1.23 (1.65)	3.94 (5.28)	.57 (.77)
BSHC G/KW HR (G/HP HR)	76.75 (57.23)	14.42 (10.75)	3.80 (2.83)	18.58 (13.86)
BSCO G/KW HR (G/HP HR)	246.21 (183.60)	101.26 (75.51)	83.44 (62.22)	154.01 (114.85)
BSCO2 G/KW HR (G/HP HR)	1213.11 (904.62)	1053.30 (785.45)	838.24 (625.08)	1083.82 (808.20)
BSNOX G/KW HR (G/HP HR)	5.73 (4.27)	10.64 (7.93)	10.91 (8.14)	8.41 (6.27)
BSFC KG/KW HR (LB/HP HR)	.581 (.955)	.397 (.652)	.309 (.509)	.437 (.718)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.35 (8.52)
BSHC G/KW HR (G/HP HR)	14.18 (10.58)
BSCO G/KW HR (G/HP HR)	108.85 (81.17)
BSCO2 G/KW HR (G/HP HR)	938 (699)
BSNOX G/KW HR (G/HP HR)	10.14 (7.56)
BSFC KG/KW HR (LB/HP HR)	.364 (.598)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-7A (CONT'D). TEST 20-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.FORD
ENGINE MODEL 72 FORD 300
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 9

TEST NO.20-3 RUN
DATE 1/17/80
TIME 09:40
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 740.66 MM HG(29.16 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 54 PCT
ABSOLUTE HUMIDITY 9.2 GM/KG(64.5 GRAINS/LB)

NOX HUMIDITY C.F. .9529

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8319	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	181.9 (6426)	205.0 (7239)	209.2 (7391)	181.7 (6418)
HC SAMPLE METER/RANGE/PPM	17.9/ 3/ 179	13.5/ 3/ 135	13.7/ 3/ 137	12.4/ 3/ 124
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13	1.3/ 3/ 13	1.5/ 3/ 15	1.4/ 3/ 14
CO SAMPLE METER/RANGE/PPM	79.2/11/ 357	89.1/11/ 434	56.0/ 3/ 1393	85.8/11/ 407
CO BCKGRD METER/RANGE/PPM	.9/11/ 3	.9/11/ 3	.1/ 3/ 2	1.8/11/ 5
CO2 SAMPLE METER/RANGE/PCT	15.1/ 3/ .24	23.2/ 3/ .38	52.1/ 3/ .91	14.9/ 3/ .24
CO2 BCKGRD METER/RANGE/PPM	3.0/ 3/ .05	2.7/ 3/ .04	3.5/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	16.2/ 2/ 16	40.8/ 2/ 41	40.0/ 3/ 120	16.3/ 2/ 16
NOX BCKGRD METER/RANGE/PPM	1.1/ 2/ 1	1.4/ 2/ 1	.6/ 3/ 2	.7/ 2/ 1
DILUTION FACTOR	45.85	31.00	12.69	46.47
HC CONCENTRATION PPM	166	122	123	110
CO CONCENTRATION PPM	346	421	1343	393
CO2 CONCENTRATION PCT	.19	.34	.86	.19
NOX CONCENTRATION PPM	15.1	39.4	118.3	15.6
HC MASS GRAMS	17.45	14.47	14.87	11.56
CO MASS GRAMS	73.35	100.42	327.13	83.11
CO2 MASS GRAMS	648.3	1262.9	3289.2	631.5
NOX MASS GRAMS	5.02	14.74	45.14	5.17
FUEL KG (LB)	.258 (.57)	.462 (1.02)	1.214 (2.68)	.252 (.56)
KW HR (HP HR)	.56 (.76)	1.24 (1.66)	3.93 (5.27)	.56 (.76)
BSHC G/KW HR (G/HP HR)	30.95 (23.08)	11.67 (8.70)	3.78 (2.82)	20.51 (15.29)
BSCO G/KW HR (G/HP HR)	130.11 (97.02)	80.96 (60.38)	83.21 (62.05)	147.42 (109.93)
BSCO2 G/KW HR (G/HP HR)	1149.98 (857.54)	1018.22 (759.28)	836.64 (623.88)	1120.07 (835.23)
BSNOX G/KW HR (G/HP HR)	8.90 (6.63)	11.88 (8.86)	11.48 (8.56)	9.17 (6.84)
BSFC KG/KW HR (LB/HP HR)	.458 (.753)	.373 (.613)	.309 (.508)	.447 (.734)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.30 (	8.45)
BSHC G/KW HR (G/HP HR)	9.26 (	6.91)
BSCO G/KW HR (G/HP HR)	92.71 (	69.13)
BSCO2 G/KW HR (G/HP HR)	926 (	690)
BSNOX G/KW HR (G/HP HR)	11.12 (	8.29)
BSFC KG/KW HR (LB/HP HR)	.347 (	.571)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-7B. TEST 20-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.FORD
ENGINE MODEL 72 FORD 300
ENGINE 0.0 L(0 CID) I-6
CVS NO. 9

TEST NO.20-4 RUN
DATE 1/18/80
TIME 09100
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

BAROMETER 743.97 MM HG(29.29 IN HG)
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 9.1 GM/KG(63.9 GRAINS/LB)

NOX HUMIDITY C.F. .9985

BAG RESULTS	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8087	8322	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.8 (6456)	206.0 (7274)	210.3 (7428)	182.6 (6450)
HC SAMPLE METER/RANGE/PPM	50.6/ 3/ 506	17.1/ 3/ 171	19.6/ 3/ 196	10.2/ 3/ 102
HC BCKGRD METER/RANGE/PPM	2.1/ 3/ 21	2.1/ 3/ 21	2.1/ 3/ 21	2.0/ 3/ 20
CO SAMPLE METER/RANGE/PPM	29.3/ 3/ 684	23.7/ 3/ 548	55.8/ 3/ 1387	90.9/11/ 995
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2	.1/ 3/ 2	.1/ 3/ 2	1.9/11/ 9
CO2 SAMPLE METER/RANGE/PCT	15.3/ 3/ .29	23.9/ 3/ .39	52.1/ 3/ .91	14.2/ 3/ .22
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .04	2.8/ 3/ .04	2.6/ 3/ .04	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	11.6/ 2/ 12	37.8/ 2/ 38	41.0/ 3/ 123	15.9/ 2/ 16
NOX BCKGRD METER/RANGE/PPM	1.3/ 2/ 1	1.2/ 2/ 1	.3/ 3/ 1	1.1/ 2/ 1
DILUTION FACTOR	37.20	29.19	12.69	48.14
HC CONCENTRATION PPM	486	151	127	82
CO CONCENTRATION PPM	666	532	1336	931
CO2 CONCENTRATION PCT	.20	.35	.87	.18
NOX CONCENTRATION PPM	10.3	36.6	122.2	14.8
HC MASS GRAMS	51.19	17.90	15.36	8.68
CO MASS GRAMS	141.86	127.60	327.31	91.72
CO2 MASS GRAMS	678.3	1309.4	3355.4	595.9
NOX MASS GRAMS	3.43	13.69	46.62	4.91
FUEL KG (LB)	.335 (.74)	.494 (1.09)	1.235 (2.72)	.242 (.53)
KW HR (HP HR)	.55 (.74)	1.21 (1.62)	3.93 (5.27)	.56 (.76)
BSHC G/KW HR (G/HP HR)	93.29 (69.57)	14.79 (11.03)	3.91 (2.91)	15.40 (11.48)
BSCO G/KW HR (G/HP HR)	258.52 (192.78)	105.43 (78.62)	83.25 (62.08)	162.69 (121.32)
BSCO2 G/KW HR (G/HP HR)	1236.13 (921.79)	1081.88 (806.76)	853.46 (636.43)	1056.94 (788.16)
BSNOX G/KW HR (G/HP HR)	6.25 (4.66)	11.31 (8.44)	11.86 (8.84)	8.71 (6.50)
BSFC KG/KW HR (LB/HP HR)	.611 (1.005)	.408 (.671)	.314 (.517)	.429 (.706)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.25 (8.39)
BSHC G/KW HR (G/HP HR)	14.89 (11.11)
BSCO G/KW HR (G/HP HR)	110.08 (82.09)
BSCO2 G/KW HR (G/HP HR)	950 (708)
BSNOX G/KW HR (G/HP HR)	10.98 (8.19)
BSFC KG/KW HR (LB/HP HR)	.369 (.606)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-7B (CONT'D). TEST 20-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.FORD
ENGINE MODEL 72 FORD 300
ENGINE 0.0 L(-0 CID) I-6
CVS NO. 9

TEST NO.20-4 RUN
DATE 1/18/80
TIME 10:20 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

BAROMETER 743.97 MM HG(29.29 IN HG)
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 9.4 GM/KG(65.7 GRAINS/LB) — NOX HUMIDITY C.F. .9579

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8086	8320	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.8 (6457)	205.9 (7273)	210.3 (7427)	182.6 (6450)
HC SAMPLE METER/RANGE/PPM	19.5/ 3/ 195	12.5/ 3/ 125	13.8/ 3/ 138	11.3/ 3/ 113
HC BCKGRD METER/RANGE/PPM	1.4/ 3/ 14	1.1/ 3/ 11	.9/ 3/ 9	.9/ 3/ 9
CO SAMPLE METER/RANGE/PPM	78.3/11/ 350	90.0/11/ 402	55.4/ 3/ 1376	85.7/11/ 406
CO BCKGRD METER/RANGE/PPM	.6/11/ 2	.8/11/ 2	.1/ 3/ 2	.5/11/ 1
CO2 SAMPLE METER/RANGE/PCT	14.6/ 3/ .23	22.4/ 3/ .36	51.8/ 3/ .90	14.0/ 3/ .22
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	1.6/ 3/ .02	2.3/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	16.2/ 2/ 16	41.1/ 2/ 41	45.5/ 3/ 136	16.6/ 2/ 17
NOX BCKGRD METER/RANGE/PPM	.9/ 2/ 1	.9/ 2/ 1	.2/ 3/ 1	.8/ 2/ 1
DILUTION FACTOR	47.02	32.04	12.78	44.20
HC CONCENTRATION PPM	181	114	130	104
CO CONCENTRATION PPM	341	428	1325	396
CO2 CONCENTRATION PCT	.19	.34	.87	.18
NOX CONCENTRATION PPM	15.3	40.2	135.9	15.8
HC MASS GRAMS	14.12	13.58	15.73	10.47
CO MASS GRAMS	72.53	102.75	324.53	84.12
CO2 MASS GRAMS	649.0	1278.5	3348.4	615.1
NOX MASS GRAMS	5.13	15.18	52.38	5.29
FUEL KG (LB)	.260 (.57)	.468 (1.03)	1.232 (2.72)	.247 (.54)
KW HR (HP HR)	.55 (.74)	1.22 (1.63)	3.94 (5.28)	.56 (.76)
BSHC G/KW HR (G/HP HR)	34.84 (25.98)	11.15 (8.32)	3.99 (2.98)	19.46 (14.51)
BSCO G/KW HR (G/HP HR)	132.17 (98.56)	84.37 (62.92)	82.39 (61.44)	149.21 (111.27)
BSCO2 G/KW HR (G/HP HR)	1182.68 (881.92)	1049.86 (782.88)	850.07 (633.90)	1091.06 (813.61)
BSNOX G/KW HR (G/HP HR)	9.35 (6.97)	12.47 (9.30)	13.30 (9.92)	9.39 (7.00)
BSFC KG/KW HR (LB/HP HR)	.473 (.778)	.384 (.631)	.313 (.514)	.437 (.719)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.27 (8.41)
BSHC G/KW HR (G/HP HR)	9.48 (7.07)
BSCO G/KW HR (G/HP HR)	93.14 (69.46)
BSCO2 G/KW HR (G/HP HR)	940 (701)
BSNOX G/KW HR (G/HP HR)	12.44 (9.28)
BSFC KG/KW HR (LB/HP HR)	.352 (.578)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-8A. TEST 21-1 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 21 — TEST NO. 21-1 RUN
ENGINE MODEL [illegible] IHC 304 — DATE 2/25/80 — GASOLINE EM-267-F
ENGINE [illegible] — TIME 09:00 — BAG CART NO. 1
CVS NO. [illegible] — DYNO NO. 2

BAROMETER [illegible] — RELATIVE HUMIDITY 48. PCT
DRY BULB TEMP. [illegible] DEG C(71.0 DEG F) — ABSOLUTE HUMIDITY 7.7 GM/KG(54.1 GRAINS/LB) — NOX HUMIDITY C.F. .9107

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7177.	8101.	8335.	7177.
TIME SECONDS	271.7	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	185.0 (6535.)	208.5 (7363.)	212.9 (7519.)	184.8 (6529.)
HC SAMPLE METER/RANGE/PPM	16.7/ 3/ 167.	85.1/ 2/ 85.	17.8/ 3/ 178.	61.4/ 2/ 61.
HC BCKGRD METER/RANGE/PPM	2.1/ 3/ 21.	19.2/ 2/ 19.	2.0/ 3/ 20.	19.0/ 2/ 19.
CO SAMPLE METER/RANGE/PPM	24.6/ 3/ 570.	24.8/ 3/ 574.	89.2/ 3/2501.	84.5/11/ 396.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 3/ 2.	2.0/11/ 6.
CO2 SAMPLE METER/RANGE/PCT	20.2/ 3/ .33	28.1/ 3/ .46	56.2/ 3/ .99	16.8/ 3/ .27
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.6/ 3/ .04	3.0/ 3/ .05	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.2/ 2/ 13.	33.4/ 2/ 33.	96.0/ 2/ 96.	12.8/ 2/ 13.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.6/ 2/ 1.	.9/ 2/ 1.	1.0/ 2/ 1.
DILUTION FACTOR	33.71	25.45	10.74	42.85
HC CONCENTRATION PPM	147.	67.	160.	43.
CO CONCENTRATION PPM	555.	558.	2413.	383.
CO2 CONCENTRATION PCT	.28	.42	.95	.23
NOX CONCENTRATION PPM	12.6	32.8	95.2	11.8
HC MASS GRAMS	15.65	8.01	19.63	4.57
CO MASS GRAMS	119.61	135.56	598.13	82.37
CO2 MASS GRAMS	960.5	1617.9	3688.7	780.1
NOX MASS GRAMS	4.07	11.92	35.30	3.81
FUEL KG (LB)	.378 (.83)	.585 (1.29)	1.479 (3.26)	.291 (.64)
KW HR (HP HR)	.57 (.77)	1.42 (1.91)	4.71 (6.31)	.65 (.87)
BSHC G/KW HR (G/HP HR)	27.39 (20.42)	5.64 (4.21)	4.17 (3.11)	7.07 (5.27)
BSCO G/KW HR (G/HP HR)	209.37 (156.13)	95.42 (71.15)	127.11 (94.78)	127.42 (95.02)
BSCO2 G/KW HR (G/HP HR)	1681.25 (1253.71)	1138.78 (849.19)	783.88 (584.54)	1206.69 (899.83)
BSNOX G/KW HR (G/HP HR)	7.12 (5.31)	8.39 (6.26)	7.50 (5.59)	5.89 (4.39)
BSFC KG/KW HR (LB/HP HR)	.661 (1.087)	.412 (.677)	.314 (.517)	.451 (.741)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.[illegible] ([illegible])
BSHC G/KW HR (G/HP HR)	[illegible] ([illegible])
BSCO G/KW HR (G/HP HR)	1[illegible] ([illegible])
BSCO2 G/KW HR (G/HP HR)	[illegible] ([illegible])
BSNOX G/KW HR (G/HP HR)	[illegible] ([illegible])
BSFC KG/KW HR (LB/HP HR)	[illegible] ([illegible])

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE D-8A (CONT'D). TEST 21-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. [illegible] — TEST NO. 21-1 RUN
ENGINE MODEL 7[illegible] IHC 304 — DATE 2/25/80
ENGINE 5.0 L(304. CID) — TIME 09:40 — GASOLINE EM-267-F
CVS NO. 9 — DYNO NO. 2 — BAG CART NO. 1

BAROMETER 751.59 MM HG(29.59 IN HG) — RELATIVE HUMIDITY 48. PCT
DRY BULB TEMP. 22.2 DEG C(72.0 DEG F) — ABSOLUTE HUMIDITY 8.1 GM/KG(56.6 GRAINS/LB) — NOX HUMIDITY C.F. .9204

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7177.	8100.	8335.	7177.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	185.1 (6537.)	208.5 (7365.)	212.9 (7521.)	184.9 (6531.)
HC SAMPLE METER/RANGE/PPM	78.9/ 2/ 79.	79.4/ 2/ 79.	17.3/ 3/ 173.	66.4/ 2/ 66.
HC BCKGRD METER/RANGE/PPM	16.8/ 2/ 17.	18.0/ 2/ 18.	1.8/ 3/ 18.	17.9/ 2/ 18.
CO SAMPLE METER/RANGE/PPM	69.8/11/ 294.	96.1/11/ 497.	89.1/ 3/2497.	84.8/11/ 399.
CO BCKGRD METER/RANGE/PPM	.7/11/ 2.	.7/11/ 2.	.2/ 3/ 5.	2.2/11/ 6.
CO2 SAMPLE METER/RANGE/PCT	17.5/ 3/ .28	27.6/ 3/ .45	56.8/ 3/ 1.00	17.9/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.9/ 3/ .04	2.4/ 3/ .04	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.4/ 2/ 13.	35.5/ 2/ 36.	32.8/ 3/ 98.	13.6/ 2/ 14.
NOX BCKGRD METER/RANGE/PPM	.7/ 2/ 1.	.7/ 2/ 1.	.3/ 3/ 1.	.8/ 2/ 1.
DILUTION FACTOR	42.39	26.30	10.65	40.38
HC CONCENTRATION PPM	62.	62.	157.	49.
CO CONCENTRATION PPM	285.	483.	2406.	384.
CO2 CONCENTRATION PCT	.24	.41	.97	.24
NOX CONCENTRATION PPM	12.7	34.8	97.6	12.8
HC MASS GRAMS	6.67	7.47	19.25	5.22
CO MASS GRAMS	61.52	117.31	596.68	82.74
CO2 MASS GRAMS	820.8	1567.4	3768.9	822.6
NOX MASS GRAMS	4.14	12.79	36.59	4.17
FUEL KG (LB)	.296 (.65)	.560 (1.23)	1.503 (3.31)	.306 (.67)
KW HR (HP HR)	.59 (.80)	1.47 (1.97)	4.71 (6.32)	.66 (.89)
BSHC G/KW HR (G/HP HR)	11.23 (8.38)	5.09 (3.80)	4.08 (3.04)	7.89 (5.88)
BSCO G/KW HR (G/HP HR)	103.59 (77.25)	80.03 (59.68)	126.60 (94.40)	125.07 (93.26)
BSCO2 G/KW HR (G/HP HR)	1382.17 (1030.68)	1069.30 (797.37)	799.64 (596.29)	1243.48 (927.27)
BSNOX G/KW HR (G/HP HR)	6.98 (5.20)	8.72 (6.50)	7.76 (5.79)	6.31 (4.70)
BSFC KG/KW HR (LB/HP HR)	.498 (.819)	.382 (.628)	.319 (.524)	.462 (.759)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.43 (9.97)
BSHC G/KW HR (G/HP HR)	5.19 (3.87)
BSCO G/KW HR (G/HP HR)	115.44 (86.08)
BSCO2 G/KW HR (G/HP HR)	939. (700.)
BSNOX G/KW HR (G/HP HR)	7.76 (5.79)
BSFC KG/KW HR (LB/HP HR)	.[illegible] (.589)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-8B. TEST 21-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 21 — TEST NO. 21-2 RUN
ENGINE MODEL 74 IMC 304 — DATE 2/26/80
ENGINE 5.0 LITER (302. CID) — TIME 08:40 — GASOLINE EM-267-F
CVS NO. 9 — DYNO NO. 2 — BAG CART NO. 1

BAROMETER 28.87 IN HG(729.6 MM HG) — RELATIVE HUMIDITY 46. PCT
DRY BULB TEMP. 21.7 DEG C(71.0 DEG F) — ABSOLUTE HUMIDITY 7.4 GM/KG(51.7 GRAINS/LB) — NOX HUMIDITY C.F. .9011

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P IN. H2O(IN. HG)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P IN. H2O(IN. HG)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7178.	8100.	8334.	7175.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. M(SCF)	185.7 (6559.)	209.2 (7389.)	213.6 (7545.)	185.5 (6550.)
HC SAMPLE METER/RANGE/PPM	24.5/ 3/ 245.	87.3/ 2/ 87.	17.1/ 3/ 171.	56.7/ 2/ 57.
HC BCKGRD METER/RANGE/PPM	1.3/ 3/ 13.	12.4/ 2/ 12.	1.4/ 3/ 14.	12.7/ 2/ 13.
CO SAMPLE METER/RANGE/PPM	29.8/ 3/ 696.	23.7/ 3/ 548.	86.0/ 3/2379.	82.9/11/ 384.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.1/ 3/ 2.	.3/ 3/ 7.	2.6/11/ 8.
CO2 SAMPLE METER/RANGE/PCT	19.7/ 3/ .32	28.0/ 3/ .46	56.9/ 3/ 1.00	17.3/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .04	2.1/ 3/ .03	2.7/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.6/ 2/ 14.	37.0/ 2/ 37.	34.8/ 3/ 104.	14.0/ 2/ 14.
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1.	.2/ 2/ 0.	.1/ 3/ 0.	.5/ 2/ 1.
DILUTION FACTOR	32.75	25.65	10.73	41.95
HC CONCENTRATION PPM	232.	75.	158.	44.
CO CONCENTRATION PPM	680.	533.	2292.	369.
CO2 CONCENTRATION PCT	.28	.43	.96	.24
NOX CONCENTRATION PPM	13.0	36.8	104.1	13.5
HC MASS GRAMS	24.89	9.10	19.50	4.74
CO MASS GRAMS	146.97	129.83	570.15	79.70
CO2 MASS GRAMS	950.6	1645.0	3771.8	811.1
NOX MASS GRAMS	4.17	13.27	38.34	4.32
FUEL KG (LB)	.397 (.88)	.592 (1.31)	1.491 (3.29)	.300 (.66)
AV HP (HP HR)	.59 (.79)	1.48 (1.99)	4.74 (6.36)	.68 (.91)
HSHC G/KW HR (G/HP HR)	42.45 (31.66)	6.14 (4.58)	4.11 (3.07)	7.00 (5.22)
HSCO G/KW HR (G/HP HR)	250.66 (186.92)	87.67 (65.38)	120.20 (89.63)	117.80 (87.84)
HSCO2 G/KW HR (G/HP HR)	1621.19 (1208.92)	1110.82 (828.34)	795.19 (592.97)	1198.91 (894.02)
HSNOX G/KW HR (G/HP HR)	7.11 (5.30)	8.96 (6.68)	8.08 (6.03)	6.38 (4.76)
HSFC KG/KW HR (LB/HP HR)	.678 (1.114)	.400 (.657)	.314 (.517)	.443 (.729)

TOTAL TEST RESULTS 4 BAGS

TOTAL HC MG (HP HR)	7.49 (10.04)	
HSHC G/KW HR (G/HP HR)	7.78 (5.80)	
HSCO G/KW HR (G/HP HR)	123.77 (92.29)	
HSCO2 G/KW HR (G/HP HR)	959. (715.)	
HSNOX G/KW HR (G/HP HR)	6.13 (5.99)	
HSFC KG/KW HR (LB/HP HR)	.371 (.610)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE D-8B (CONT'D). TEST 21-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 21 — TEST NO. 21-2 RUN
ENGINE MODEL 23 DPC 304 — DATE 2/26/80
ENGINE 5.0 LITER (CID) — TIME 0800 — GASOLINE EM-267-F
EVS NO. 9 — DYNO NO. 2 — BAG CART NO. 1

BAROMETER 29.33 IN HG(74.56 IN HG) — RELATIVE HUMIDITY 46. PCT
DRY BULB TEMP. 21.0 DEG C(70.0 DEG F) — ABSOLUTE HUMIDITY 7.5 GM/KG(52.4 GRAINS/LB) — NOX HUMIDITY C.F. .9040

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P IN. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P IN. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7174.	8097.	8332.	7173.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METERS(SCF)	184.9 (6532.)	208.4 (7360.)	212.8 (7516.)	184.7 (6525.)
HC SAMPLE METER/RANGE/PPM	75.9/ 2/ 76.	81.5/ 2/ 82.	17.3/ 3/ 173.	57.8/ 2/ 58.
HC RECORD METER/RANGE/PPM	14.8/ 2/ 15.	15.5/ 2/ 16.	1.5/ 3/ 15.	15.7/ 2/ 16.
CO SAMPLE METER/RANGE/PPM	71.3/11/ 303.	95.1/11/ 488.	86.5/ 3/2398.	82.0/11/ 377.
CO RECORD METER/RANGE/PPM	.2/11/ 1.	.5/11/ 1.	.2/ 3/ 5.	1.4/11/ 4.
CO2 SAMPLE METER/RANGE/PCT	17.5/ 3/ .28	27.1/ 3/ .44	56.5/ 3/ .99	17.5/ 3/ .28
CO2 RECORD METER/RANGE/PCT	2.6/ 3/ .04	2.5/ 3/ .04	2.6/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	14.0/ 2/ 14.	39.2/ 2/ 39.	35.2/ 3/ 106.	14.1/ 2/ 14.
NOX RECORD METER/RANGE/PPM	.5/ 2/ 1.	.6/ 2/ 1.	.1/ 3/ 0.	.6/ 2/ 1.
DILUTION FACTOR	42.31	26.80	10.78	41.59
HC CONCENTRATION PPM	61.	67.	159.	42.
CO CONCENTRATION PPM	296.	475.	2316.	366.
CO2 CONCENTRATION PCT	.24	.41	.96	.24
NOX CONCENTRATION PPM	13.5	38.6	105.3	13.5
HC MASS GRAMS	6.55	8.00	19.56	4.53
CO MASS GRAMS	63.81	115.20	572.97	78.66
CO2 MASS GRAMS	815.1	1555.2	3732.1	819.4
NOX MASS GRAMS	4.32	13.92	38.76	4.32
FUEL KG (LB)	.295 (.651)	.555 (1.22)	1.480 (3.26)	.302 (.671)
KW HR (HP HR)	.61 (.821)	1.50 (2.02)	4.74 (6.35)	.67 (.901)
BSHC G/KW HR (G/HP HR)	10.76 (8.03)	5.32 (3.97)	4.13 (3.08)	6.77 (5.04)
BSCO G/KW HR (G/HP HR)	104.80 (78.15)	76.62 (57.14)	120.99 (90.22)	117.58 (87.68)
BSCO2 G/KW HR (G/HP HR)	1338.63 (998.22)	1034.45 (771.39)	788.06 (587.66)	1224.71 (913.27)
BSNOX G/KW HR (G/HP HR)	7.10 (5.29)	9.26 (6.90)	8.18 (6.10)	6.45 (4.81)
BSFC KG/KW HR (LB/HP HR)	.485 (.797)	.369 (.607)	.312 (.514)	.451 (.742)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	7.52 (10.06)
BSHC G/KW HR (G/HP HR)	5.14 (3.83)
BSCO G/KW HR (G/HP HR)	110.50 (82.40)
BSCO2 G/KW HR (G/HP HR)	921. (687.)
BSNOX G/KW HR (G/HP HR)	8.15 (6.08)
BSFC KG/KW HR (LB/HP HR)	.356 (.576)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.01)

TABLE D-9A. TEST 22-3 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

TEST NO. 22-3 RUN
DATE 3/12/80
TIME 9:00
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 1

RELATIVE HUMIDITY 51. PCT
ABSOLUTE HUMIDITY 9.1 GM/KG(63.7 GRAINS/LB)

NOX HUMIDITY C.F. .9498

	1 NYNF	2 LANF	3 LAF	4 NYNF
	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
	7168.	8089.	8320.	7165.
	272.0	307.0	316.0	272.0
	180.4 (6373.)	203.3 (7179.)	207.4 (7327.)	180.2 (6364.)
	25.8/ 3/ 258.	17.3/ 3/ 173.	27.1/ 3/ 271.	89.7/ 2/ 90.
	1.2/ 3/ 12.	1.3/ 3/ 13.	1.4/ 3/ 14.	14.2/ 2/ 14.
	42.8/ 3/1028.	41.9/ 3/1004.	76.7/ 2/4332.	24.4/ 3/ 565.
	.2/ 3/ 5.	.2/ 3/ 5.	.2/ 2/ 8.	.4/ 3/ 9.
	20.6/ 3/ .33	32.6/ 3/ .54	66.0/ 3/ 1.18	18.3/ 3/ .29
	2.7/ 3/ .04	2.7/ 3/ .04	3.1/ 3/ .05	3.0/ 3/ .05
	14.3/ 2/ 14.	34.2/ 2/ 34.	86.3/ 2/ 86.	13.8/ 2/ 14.
	1.0/ 2/ 1.	.9/ 2/ 1.	1.2/ 2/ 1.	1.7/ 2/ 2.
	29.25	20.39	8.24	37.52
	246.	161.	259.	76.
	1000.	973.	4155.	544.
	.29	.50	1.14	.25
	13.3	33.3	85.2	12.1
	25.64	18.83	30.95	7.89
	210.14	230.28	1003.74	114.08
	964.8	1872.3	4336.2	819.1
	4.37	12.31	32.13	3.98
	.434 (.96)	.723 (1.59)	1.895 (4.18)	.323 (.71)
	.63 (.85)	1.61 (2.16)	5.26 (7.05)	.64 (.86)
	40.44 (30.15)	11.69 (8.72)	5.89 (4.39)	12.29 (9.17)
	331.37 (247.10)	142.95 (106.60)	190.98 (142.42)	177.85 (132.62)
	1521.30 (1134.44)	1162.24 (866.69)	825.06 (615.25)	1276.89 (952.18)
	6.69 (5.14)	7.64 (5.70)	6.11 (4.56)	6.20 (4.62)
	.684 (1.125)	.449 (.738)	.361 (.593)	.503 (.827)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

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TABLE D-9A (CONT'D). TEST 22-3 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO. 22 — TEST NO. 22-3 RUN
ENGINE MODEL [illegible] — DATE 3/12/80
ENGINE 6.6 L(400. CID) V-8 — TIME 9:40 — GASOLINE EM-267-F
CVS NO. [illegible] — DYNO NO. 2 — BAG CART NO. 1

BAROMETER [illegible] MM HG([illegible] IN HG) — RELATIVE HUMIDITY 49. PCT
DRY BULB TEMP. [illegible] DEG C([illegible] DEG F) — ABSOLUTE HUMIDITY 8.7 GM/KG(61.2 GRAINS/LB) — NOX HUMIDITY C.F. .9391

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167.	8090.	8322.	7166.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.4 (6372.)	203.3 (7180.)	207.5 (7329.)	180.2 (6365.)
HC SAMPLE METER/RANGE/PPM	93.0/ 2/ 93.	13.5/ 3/ 135.	26.5/ 3/ 265.	77.3/ 2/ 77.
HC BCKGRD METER/RANGE/PPM	12.5/ 2/ 13.	1.2/ 3/ 12.	1.2/ 3/ 12.	12.0/ 2/ 12.
CO SAMPLE METER/RANGE/PPM	23.5/ 3/ 543.	37.7/ 3/ 895.	76.2/ 2/4290.	97.3/11/ 509.
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 2.	.1/ 3/ 2.	.2/ 2/ 8.	3.9/11/ 11.
CO2 SAMPLE METER/RANGE/PCT	18.3/ 3/ .29	30.2/ 3/ .50	65.6/ 3/ 1.18	17.8/ 3/ .28
CO2 BCKGRD METER/RANGE/PCT	2.3/ 3/ .04	2.2/ 3/ .03	2.6/ 3/ .04	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	12.8/ 2/ 13.	33.1/ 2/ 33.	88.4/ 2/ 88.	13.8/ 2/ 14.
NOX BCKGRD METER/RANGE/PPM	1.8/ 2/ 2.	2.0/ 2/ 2.	2.0/ 2/ 2.	1.8/ 2/ 2.
DILUTION FACTOR	37.71	22.34	8.30	39.18
HC CONCENTRATION PPM	81.	124.	254.	66.
CO CONCENTRATION PPM	529.	870.	4118.	487.
CO2 CONCENTRATION PCT	.26	.47	1.14	.25
NOX CONCENTRATION PPM	11.0	31.2	86.6	12.0
HC MASS GRAMS	8.41	14.48	30.45	6.82
CO MASS GRAMS	111.22	205.96	995.04	102.18
CO2 MASS GRAMS	654.7	1739.1	4332.2	826.0
NOX MASS GRAMS	3.58	11.39	32.30	3.90
FUEL KG (LB)	.333 (.73)	.665 (1.47)	1.889 (4.16)	.318 (.70)
KW HR (HP HR)	.66 (.89)	1.60 (2.14)	5.27 (7.07)	.64 (.86)
BSHC G/KW HR (G/HP HR)	12.68 (9.46)	9.07 (6.77)	5.78 (4.31)	10.63 (7.93)
BSCO G/KW HR (G/HP HR)	167.67 (125.03)	129.02 (96.21)	188.81 (140.79)	159.29 (118.78)
BSCO2 G/KW HR (G/HP HR)	1288.56 (960.88)	1089.39 (812.36)	822.03 (612.99)	1287.64 (960.20)
BSNOX G/KW HR (G/HP HR)	5.40 (4.03)	7.14 (5.32)	6.13 (4.57)	6.08 (4.53)
BSFC KG/KW HR (LB/HP HR)	.502 (.825)	.416 (.685)	.358 (.589)	.495 (.815)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	[illegible] ([illegible])
BSHC G/KW HR (G/HP HR)	7.36 (5.49)
BSCO G/KW HR (G/HP HR)	171.69 (129.08)
BSCO2 G/KW HR (G/HP HR)	[illegible] (707.)
BSNOX G/KW HR (G/HP HR)	[illegible] ([illegible])
BSFC KG/KW HR (LB/HP HR)	[illegible] (.645)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-9B. TEST 22-4 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

TEST NO. 22-4 RUN
DATE 3/17/80
TIME 09:00 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

RELATIVE HUMIDITY 52. PCT
ABSOLUTE HUMIDITY 8.9 GM/KG(62.1 GRAINS/LB) — NOX HUMIDITY C.F. .9430

	1 NYNF	2 LANF	3 LANF	4 NYNF
	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
	7169.	8091.	8322.	7166.
	272.0	307.0	316.0	272.0
	182.6 (6448.)	205.7 (7265.)	209.9 (7415.)	182.3 (6440.)
	35.2/ 3/ 352.	17.9/ 3/ 179.	27.6/ 3/ 276.	72.1/ 2/ 72.
	1.2/ 3/ 12.	1.4/ 3/ 14.	1.3/ 3/ 13.	13.0/ 2/ 13.
	44.3/ 3/1068.	40.2/ 3/ 960.	77.6/ 2/4408.	22.3/ 3/ 515.
	.1/ 3/ 2.	.1/ 3/ 2.	.1/ 2/ 4.	.3/ 3/ 7.
	20.8/ 3/ .34	32.8/ 3/ .55	67.2/ 3/ 1.21	18.8/ 3/ .30
	2.4/ 3/ .04	2.5/ 3/ .04	2.7/ 3/ .04	2.7/ 3/ .04
	15.5/ 2/ 16.	37.1/ 2/ 37.	82.4/ 2/ 82.	14.3/ 2/ 14.
	.5/ 2/ 1.	.5/ 2/ 1.	.8/ 2/ 1.	1.4/ 2/ 1.
	28.23	20.39	8.08	37.34
	340.	166.	265.	59.
	1041.	931.	4228.	496.
	.30	.51	1.17	.26
	15.0	36.6	81.7	12.9
	35.85	19.66	32.04	6.25
	221.29	223.07	1033.70	105.40
	1002.6	1919.3	4502.8	872.0
	4.35	13.59	30.94	4.25
	.402 (1.02)	.735 (1.62)	1.964 (4.33)	.333 (.73)
	.62 (.83)	1.57 (2.11)	5.28 (7.09)	.63 (.85)
	57.65 (43.14)	12.48 (9.31)	6.06 (4.52)	9.86 (7.35)
	357.15 (266.32)	141.68 (105.65)	195.60 (145.86)	166.20 (123.93)
	1618.21 (1206.70)	1218.99 (909.00)	852.04 (635.37)	1374.95 (1025.30)
	7.98 (5.95)	8.63 (6.44)	5.85 (4.37)	6.71 (5.00)
	.745 (1.225)	.467 (.768)	.372 (.611)	.526 (.864)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER
SAMPLE FLOW SCM(SCF) 0.000 (0.00)
MULTIPLIER FOR G/TEST 0.000
MULTIPLIER FOR G/KW HR (G/HP HR) 0.0000 (0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL) 0.0000 (0.0000)

20 X 23 FILTERS
SAMPLE FLOW SCM(SCF) 0.00 (0.0)

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TABLE D-9B (CONT'D). TEST 22-4 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

TEST NO. 22-4 RUN
DATE 3/17/80
TIME 0934C — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 1

RELATIVE HUMIDITY 53. PCT
ABSOLUTE HUMIDITY 9.4 GM/KG(65.5 GRAINS/LB) — NOX HUMIDITY C.F. .9575

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
DESCRIPTION				
ELAPSED TIME (SEC, DECIMAL, MIN)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
FULL SCALE (SEC, DECIMAL, MIN)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
DILUTE INLET TEMP. DEG. (DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
DILUTE EXHAUST	7167.	8089.	8322.	7166.
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL DILUTE STD. CU. METERS(SCF)	182.5 (6446.)	205.6 (7263.)	209.9 (7415.)	182.3 (6440.)
HC SAMPLE PPM/RANGE/PPM	80.9/ 2/ 81.	13.7/ 3/ 137.	25.9/ 3/ 259.	76.2/ 2/ 76.
HC BCKGRD PPM/RANGE/PPM	12.3/ 2/ 12.	1.3/ 3/ 13.	1.2/ 3/ 12.	11.6/ 2/ 12.
CO SAMPLE PPM/RANGE/PPM	22.3/ 3/ 515.	34.7/ 3/ 819.	75.5/ 2/4231.	22.9/ 3/ 529.
CO BCKGRD PPM/RANGE/PPM	.1/ 3/ 2.	.3/ 3/ 7.	.2/ 2/ 8.	.2/ 3/ 5.
CO2 SAMPLE PCT/RANGE/PCT	19.1/ 3/ .31	32.4/ 3/ .54	68.5/ 3/ 1.23	20.0/ 3/ .32
CO2 BCKGRD PCT/RANGE/PCT	2.6/ 3/ .04	2.9/ 3/ .04	3.0/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE PPM/RANGE/PPM	12.6/ 2/ 12.	33.7/ 2/ 34.	83.8/ 2/ 84.	14.5/ 2/ 15.
NOX BCKGRD PPM/RANGE/PPM	.1/ 2/ 0.	.1/ 2/ 0.	.4/ 2/ 0.	.2/ 2/ C.
DILUTION FACTOR	36.74	21.20	8.05	35.18
HC CONCENTRATION PPM	69.	125.	248.	65.
CO CONCENTRATION PPM	501.	790.	4052.	512.
CO2 CONCENTRATION PCT	.27	.50	1.19	.27
NOX CONCENTRATION PPM	11.9	33.6	83.4	14.3
HC MASS GRAMS	7.26	14.78	30.09	6.83
CO MASS GRAMS	106.38	189.10	990.51	108.75
CO2 MASS GRAMS	894.9	1869.3	4588.6	915.0
NOX MASS GRAMS	3.98	12.66	32.09	4.78
FUEL KG (LB)	.342 (.75)	.698 (1.54)	1.967 (4.34)	.349 (.77)
KG PER MILE (-)	.63 (.85)	1.59 (2.13)	5.28 (7.08)	.66 (.89)
HSEC G/KM PER KG/HP HR)	11.44 (8.53)	9.30 (6.94)	5.70 (4.25)	10.29 (7.68)
HSEC G/MI PER KG/HP HR)	167.75 (125.09)	119.00 (88.74)	187.69 (139.96)	163.95 (122.25)
HSEC2 G/KM PER KG/HP HR)	1411.11 (1052.26)	1176.33 (877.19)	869.47 (648.36)	1379.35 (1028.58)
HSEC G/MI PER KG/HP HR)	6.27 (4.68)	7.96 (5.94)	6.08 (4.53)	7.20 (5.37)
HSEC NOX PER KG/HP HR)	.539 (.887)	.439 (.722)	.373 (.613)	.526 (.865)

TOTAL TEST RESULTS & GMS

TOTAL HC PER KG/HP HR)	5.16 (10.95)
TOTAL CO PER KG/HP HR)	7.22 (5.38)
TOTAL CO2 PER KG/HP HR)	170.94 (127.39)
TOTAL HSEC PER KG/HP HR)	1013. (755.)
TOTAL NOX PER KG/HP HR)	6.23 (4.64)
TOTAL HSEC NOX PER KG/HP HR)	.611 (.776)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-10A. TEST 11-6 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.GM366
ENGINE MODEL 73 GM 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 11-6 RUN
DATE 6/ 1/79
TIME 09:12 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 741.93 MM HG(29.21 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 57 PCT
ABSOLUTE HUMIDITY 11.9 GM/KG(83.2 GRAINS/LB) — NOX HUMIDITY C.F. 1.0403

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8087	8319	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.3 (6439)	205.4 (7253)	209.6 (7404)	182.0 (6430)
HC SAMPLE METER/RANGE/PPM	54.9/ 3/ 549	29.2/ 3/ 292	24.6/ 3/ 246	14.0/ 3/ 140
HC BCKGRD METER/RANGE/PPM	2.5/ 3/ 25	2.9/ 3/ 29	2.0/ 3/ 20	2.0/ 3/ 20
CO SAMPLE METER/RANGE/PPM	73.2/ 3/ 2153	48.5/ 3/ 1428	83.1/ 2/ 5397	31.7/ 3/ 936
CO BCKGRD METER/RANGE/PPM	1.1/ 3/ 34	1.2/ 3/ 37	.7/ 2/ 42	.7/ 2/ 42
CO2 SAMPLE METER/RANGE/PCT	19.3/ 3/ .31	31.8/ 3/ .53	60.8/ 3/ 1.07	19.3/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.3/ 3/ .05	3.4/ 3/ .05	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	6.6/ 2/ 7	23.4/ 2/ 23	30.5/ 2/ 30	7.5/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.3/ 2/ 0	.3/ 2/ 0
DILUTION FACTOR	23.26	14.23	8.31	32.17
HC CONCENTRATION PPM	525	265	228	121
CO CONCENTRATION PPM	2069	1353	5150	874
CO2 CONCENTRATION PCT	.26	.48	1.02	.26
NOX CONCENTRATION PPM	6.5	23.3	30.2	7.2
HC MASS GRAMS	55.21	31.33	27.62	12.67
CO MASS GRAMS	439.27	323.66	1257.28	185.18
CO2 MASS GRAMS	872.2	1809.1	3932.4	869.0
NOX MASS GRAMS	2.36	9.52	12.61	2.61
FUEL KG (LB)	.548 (1.21)	.762 (1.68)	1.890 (4.17)	.378 (.83)
KW HR (HP HR)	.70 (.93)	1.56 (2.09)	5.11 (6.85)	.70 (.94)
BSHC G/KW HR (G/HP HR)	79.38 (59.20)	20.14 (15.02)	5.41 (4.03)	18.02 (13.44)
BSCO G/KW HR (G/HP HR)	631.64 (471.01)	208.09 (155.17)	246.17 (183.57)	263.45 (196.45)
BSCO2 G/KW HR (G/HP HR)	1254.21 (935.24)	1163.13 (867.34)	769.94 (574.14)	1236.25 (921.87)
BSNOX G/KW HR (G/HP HR)	3.39 (2.53)	6.12 (4.57)	2.47 (1.84)	3.72 (2.77)
BSFC KG/KW HR (LB/HP HR)	.788 (1.295)	.490 (.805)	.370 (.608)	.538 (.885)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.06 (10.81)
BSHC	G/KW HR (G/HP HR)	15.73 (11.73)
BSCO	G/KW HR (G/HP HR)	273.58 (204.01)
BSCO2	G/KW HR (G/HP HR)	928 (692)
BSNOX	G/KW HR (G/HP HR)	3.36 (2.51)
BSFC	KG/KW HR (LB/HP HR)	.444 (.730)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-10A (CONT'D). TEST 11-6 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.GM366
ENGINE MODEL 73 GM 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 11-6 RUN
DATE 6/ 1/79
TIME 09:53
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.73 MM HG(29.21 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 55 PCT
ABSOLUTE HUMIDITY 11.6 GM/KG(81.2 GRAINS/LB)

NOX HUMIDITY C.F. 1.0298

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8085	8317	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.2 (6436)	205.3 (7252)	209.6 (7402)	182.0 (6430)
HC SAMPLE METER/RANGE/PPM	32.6/ 3/ 326	25.0/ 3/ 250	28.4/ 3/ 284	20.6/ 3/ 206
HC BCKGRD METER/RANGE/PPM	2.0/ 3/ 20	2.2/ 3/ 22	1.9/ 3/ 19	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	24.7/ 3/ 732	43.5/ 3/ 1281	79.4/ 2/ 5157	29.2/ 3/ 863
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.9/ 3/ 28	.3/ 2/ 18	.9/ 3/ 28
CO2 SAMPLE METER/RANGE/PCT	17.8/ 3/ .29	30.2/ 3/ .50	61.5/ 3/ 1.08	18.6/ 3/ .30
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	2.9/ 3/ .04	3.1/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	8.5/ 2/ 9	22.8/ 2/ 23	35.2/ 2/ 35	8.0/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.3/ 2/ 0	.4/ 2/ 0	.6/ 2/ 1
DILUTION FACTOR	34.37	20.61	8.33	33.15
HC CONCENTRATION PPM	307	229	267	140
CO CONCENTRATION PPM	695	1220	4942	817
CO2 CONCENTRATION PCT	.29	.46	1.04	.26
NOX CONCENTRATION PPM	8.2	22.5	34.8	7.4
HC MASS GRAMS	32.22	27.13	32.31	19.90
CO MASS GRAMS	147.38	291.79	1206.08	173.14
CO2 MASS GRAMS	799.8	1723.2	3999.6	854.3
NOX MASS GRAMS	2.95	9.11	14.39	2.66
FUEL KG (LB)	.357 (.79)	.715 (1.58)	1.891 (4.17)	.375 (.83)
KW HR (HP HR)	.67 (.89)	1.56 (2.09)	5.11 (6.85)	.70 (.94)
BSHC G/KW HR (G/HP HR)	48.41 (36.10)	17.44 (13.00)	6.33 (4.72)	28.31 (21.11)
BSCO G/KW HR (G/HP HR)	221.45 (165.13)	187.59 (139.89)	236.14 (176.09)	246.31 (183.68)
BSCO2 G/KW HR (G/HP HR)	1201.73 (896.13)	1107.87 (826.14)	783.10 (583.96)	1215.35 (906.29)
BSNOX G/KW HR (G/HP HR)	4.43 (3.30)	5.85 (4.37)	2.82 (2.10)	3.79 (2.82)
BSFC KG/KW HR (LB/HP HR)	.537 (.883)	.460 (.756)	.370 (.609)	.533 (.877)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.03	(10.77)
BSHC G/KW HR (G/HP HR)	13.89	(10.36)
BSCO G/KW HR (G/HP HR)	226.41	(168.84)
BSCO2 G/KW HR (G/HP HR)	919	(685)
BSNOX G/KW HR (G/HP HR)	3.62	(2.70)
BSFC KG/KW HR (LB/HP HR)	.416	(.683)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER			
SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)
20 X 20 FILTERS			
SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE D-10B. TEST 11-8 EMISSIONS RESULTS

COLD TRANSIENT ,PROJECT NO. 11-5044-001

ENGINE NO.GM366
ENGINE MODEL 73 GM 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 11-8 RUN
DATE 6/ 7/79
TIME 08342
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.33 MM HG(28.95 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 60 PCT
ABSOLUTE HUMIDITY 12.8 GM/KG(89.3 GRAINS/LB) NOX HUMIDITY C.F. 1.0721

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7159	8080	8312	7158
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.4 (6372)	203.3 (7179)	207.5 (7328)	180.2 (6365)
HC SAMPLE METER/RANGE/PPM	65.4/ 3/ 654	37.6/ 3/ 376	32.2/ 3/ 322	24.3/ 3/ 243
HC BCKGRD METER/RANGE/PPM	2.1/ 3/ 21	3.0/ 3/ 30	2.7/ 3/ 27	2.4/ 3/ 24
CO SAMPLE METER/RANGE/PPM	48.9/ 3/ 1440	49.7/ 3/ 1464	82.1/ 2/ 5332	30.8/ 3/ 910
CO BCKGRD METER/RANGE/PPM	.3/ 3/ 9	.1/ 3/ 3	.7/ 2/ 42	1.5/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	21.3/ 3/ .35	33.3/ 3/ .56	65.6/ 3/ 1.16	19.4/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.2/ 3/ .05	3.0/ 3/ .05	2.6/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.2/ 2/ 9	24.5/ 2/ 24	43.5/ 2/ 43	7.5/ 2/ 8
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.1/ 2/ 0	.3/ 2/ 0
DILUTION FACTOR	29.32	18.22	7.85	31.47
HC CONCENTRATION PPM	634	348	298	215
CO CONCENTRATION PPM	1394	1917	5073	843
CO2 CONCENTRATION PCT	.30	.51	1.12	.27
NOX CONCENTRATION PPM	9.1	24.4	43.4	7.2
HC MASS GRAMS	65.95	40.75	35.71	22.34
CO MASS GRAMS	292.80	335.28	1225.56	176.98
CO2 MASS GRAMS	975.6	1896.4	4273.4	895.6
NOX MASS GRAMS	3.37	10.17	18.47	2.66
FUEL KG (LB)	.519 (1.14)	.805 (1.77)	1.990 (4.39)	.392 (.86)
KW HR (HP HR)	.70 (.94)	1.59 (2.13)	5.07 (6.80)	.69 (.92)
BSHC G/KW HR (G/HP HR)	93.83 (69.97)	25.71 (19.17)	7.04 (5.25)	32.47 (24.21)
BSCO G/KW HR (G/HP HR)	416.55 (310.62)	211.49 (157.71)	241.73 (180.26)	257.25 (191.83)
BSCO2 G/KW HR (G/HP HR)	1387.90 (1034.96)	1196.20 (892.01)	842.87 (628.53)	1301.85 (970.79)
BSNOX G/KW HR (G/HP HR)	4.79 (3.57)	6.42 (4.79)	3.64 (2.72)	3.87 (2.89)
BSFC KG/KW HR (LB/HP HR)	.738 (1.213)	.508 (.834)	.392 (.645)	.570 (.938)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.05 (10.79)
BSHC	G/KW HR (G/HP HR)	20.98 (15.27)
BSCO	G/KW HR (G/HP HR)	252.37 (188.19)
BSCO2	G/KW HR (G/HP HR)	999 (745)
BSNOX	G/KW HR (G/HP HR)	4.31 (3.21)
BSFC	KG/KW HR (LB/HP HR)	.461 (.757)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE D-10B (CONT'D). TEST 11-8 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.GM366
ENGINE MODEL 73 GM 366
ENGINE 6.0 L(366 CID) V-8
CVS NO. 9

TEST NO. 11-8 RUN
DATE 6/ 7/79
TIME 09:22
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.33 MM HG(28.95 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 58 PCT
ABSOLUTE HUMIDITY 12.4 GM/KG(86.6 GRAINS/LB)

NOX HUMIDITY C.F. 1.0576

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7161	8082	8313	7159
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	180.5 (6374)	203.3 (7181)	207.5 (7329)	180.2 (6366)
HC SAMPLE METER/RANGE/PPM	37.4/ 3/ 374	29.0/ 3/ 290	29.9/ 3/ 299	23.0/ 3/ 230
HC BCKGRD METER/RANGE/PPM	3.0/ 3/ 30	3.0/ 3/ 30	3.0/ 3/ 30	2.9/ 3/ 29
CO SAMPLE METER/RANGE/PPM	29.3/ 3/ 720	42.1/ 3/ 1240	78.6/ 2/ 5105	30.8/ 3/ 910
CO BCKGRD METER/RANGE/PPM	.3/ 3/ 9	.7/ 3/ 21	0.0/ 2/ 0	.8/ 3/ 24
CO2 SAMPLE METER/RANGE/PCT	18.2/ 3/ .29	30.1/ 3/ .50	59.8/ 3/ 1.05	19.2/ 3/ .31
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	2.9/ 3/ .04	3.8/ 3/ .06	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	8.6/ 2/ 9	22.9/ 2/ 23	34.0/ 2/ 34	8.6/ 2/ 9
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.5/ 2/ 1	.7/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	33.48	20.67	8.53	31.81
HC CONCENTRATION PPM	345	261	273	202
CO CONCENTRATION PPM	694	1185	4906	864
CO2 CONCENTRATION PCT	.25	.46	1.00	.26
NOX CONCENTRATION PPM	8.3	22.4	33.4	7.8
HC MASS GRAMS	35.90	30.66	32.61	20.99
CO MASS GRAMS	145.84	280.55	1185.33	181.37
CO2 MASS GRAMS	819.5	1649.7	3796.7	874.6
NOX MASS GRAMS	3.03	4.22	14.01	2.85
FUEL KG (LB)	.366 (.81)	.705 (1.56)	1.817 (4.01)	.387 (.85)
KW HR (HP HR)	.67 (.90)	1.57 (2.11)	5.08 (6.81)	.69 (.92)
BSHC G/KW HR (G/HP HR)	53.39 (39.77)	19.52 (14.56)	6.42 (4.79)	30.51 (22.75)
BSCO G/KW HR (G/HP HR)	216.70 (161.59)	178.65 (133.22)	233.45 (174.08)	263.63 (196.59)
BSCO2 G/KW HR (G/HP HR)	1217.60 (907.97)	1082.37 (807.12)	747.75 (557.60)	1271.29 (948.00)
BSNOX G/KW HR (G/HP HR)	4.51 (3.36)	5.87 (4.38)	2.76 (2.06)	4.15 (3.09)
BSFC KG/KW HR (LB/HP HR)	.545 (.895)	.449 (.739)	.358 (.588)	.562 (.924)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.01 (10.74)
BSHC	G/KW HR (G/HP HR)	15.00 (11.19)
BSCO	G/KW HR (G/HP HR)	223.89 (166.95)
BSCO2	G/KW HR (G/HP HR)	898 (670)
BSNOX	G/KW HR (G/HP HR)	3.64 (2.71)
BSFC	KG/KW HR (LB/HP HR)	.909 (.672)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER		
SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)
20 X 20 FILTERS		
SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

APPENDIX E

NO_x BASELINE ENGINE TUNE-UP RECORD SHEETS

Table Number	Engine Number	Description
E-1	14	1972 Ford 361
E-2	15	1973 Chevrolet 454
E-3	16 [a]	1972 Dodge 413
E-4	17	1973 GMC 427
E-5	18	1972 Chevrolet 350
E-6	19 [a]	1972 IHC 345
E-7	20	1972 Ford 300
E-8	21	1973 IHC 304
E-9	22	1973 GMC 366
E-10	11 [b]	1973 GMC 366

[a] More extensive tune-ups were conducted starting with Engine 16. Modified tune-up data sheets were used starting with Engine 19.

[b] Engine 11 was retested as Engine 22.

TABLE E-1. ENGINE 14 TUNE-UP SPECIFICATIONS

CHECK LIST

M/Y 1972 Manufacturer Ford Displacement 361 Engine No. 14

	Manufacturer Spec.	As Received	After Tune-up
Carburetor Type Manufacturer & Serial No.		2 Bore Holley D3AE-9510-CA	
Fuel Pressure	4½ - 6½		
Curb Idle Speed (engine oil over 200°F)		750 rpm	
Fast Idle Speed (if auto)	none		none
Choke Setting (if auto)	none		
Dashpot Gap			
Governor No.			
Governor Speed A. No Load B. Fully Loaded	3800 3600		3600
Distributor Type	--		--
Manufacturer & Serial No.	D3TF 12102CA	Autolite C8TF 12102A	--
Vacuum Advance No.			
Dwell	24-30 27° .017	26.5°	26.5°
Timing @ RPM	6° BTDC 6° Damper	10°	6°
Primary Resistor Valve			
Total Advance @ RPM & In. Hg.			
Mech. Adv. RPM & Deg. Adv. 1. 2. 3. 4. 5. 6. 7.	advance starts at 500 Max - 11° at 2000		700 - Starts 2000 - 12°

TABLE E-1 (Cont'd). ENGINE 14 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1972 Manufacturer Ford Displacement 361 Engine No. 14

		Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv.	1. 2. 3. 4.	advance starts at 5 max 7½ at 20		6" - Starts 13" - 7° 20" - 7°
Spark Plugs Type & Manuf.		BF-31 Autolite	BF-42 Autolite	
Spark Plug Gap		.030	.028	.030
Spark Plug Torque (in lbs.)		15-20 ft lbs		15-20 ft lbs
Max. Engine Torque @ RPM		345 at 2000 298 at 2400		
Max. Engine HP @ RPM		210 at 4000 153 at 3600		
Flywheel Bolt Torque		75-85 ft-lbs		
Cylinder Compression	1. 2. 3. 4. 5. 6. 7. 8.	plus or minus 20 lbs	110 105 110 80 120 120 105 120	

Comments:

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TABLE E-2. ENGINE 15 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1972 Manufacturer Dodge Displacement 413 Engine No. 15

	Manufacturer Spec.	As Received	After Tune-Up
	—	4-bore Holley 3698345 2802 List-6445	—
Fuel Pressure	3½ - 5	—	4
Curb Idle Speed (engine oil over 200°F)	—	720	700
Fast Idle Speed (if auto)	—	—	—
Choke Setting (if auto)	—	—	—
Dashpot Gap	—	—	—
Governor No.	—	—	—
Governor Speed A. No Load B. Fully Loaded	N.A.	—	N.A.
Distributor Type	Electronic ignition - rotation cc	—	
Manufacturer & Serial No.	3656834	3656834	—
Vacuum Advance No.	N.D.	N.D.	—
Dwell	28 32	34°	30°
Timing @ RPM	5° Damper	15°	5°
Primary Resistor Valve	—	—	—
Total Advance @ RPM & In. Hg.	23° @ 1900 + 13½	—	22° @ 1900 + 13½
Mech. Adv. RPM & Deg. Adv. 1. 2. 3. 4. 5. 6. 7.	Advance starts 1-4 at 550 Full advance 13½ @ 1900	—	1 at 550 13 at 1900

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TABLE E-2 (Cont'd). ENGINE 15 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1942 Manufacturer Dodge Displacement 413 Engine No. 15

		Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv.	1. 2. 3. 4.	9½" of vacuum to start plunger 9½" at 13½ is max. adv. Dist. deg. at vacuum	— —	Start at 9½" 9° at 13½"
Spark Plugs Type & Manuf.		Champion N-6	Champion N-6	Champion N-6
Spark Plug Gap		.035	.035	.035
Spark Plug Torque (in lbs.)		30 ft-lbs	—	30 ft-lbs
Max. Engine Torque @ RPM		—	—	N A
Max. Engine HP @ RPM		—	—	N A
Flywheel Bolt Torque		55 ft. lbs	—	—
Cylinder Compression	1. 2. 3. 4. 5. 6. 7. 8.	100 minimum compression pressure Maximum variation between cylinders 40 psi	Left Front Right: 105 110 110 105 105 105 100 105	—

Comments:

TABLE E-3. ENGINE 16 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1973 Manufacturer CHEVROLET Displacement 454 Engine No. 16

	Manufacturer Spec.	As Received	After Tune-up
Carburetor Type Manufacturer & Serial No.	ROCHESTER Model 7043209		ROCHESTER QUADRAJET
Fuel Pressure	7½ - 8 psi		5 psi
Curb Idle Speed (engine oil over 200°F)	700 rpm		700 rpm
Fast Idle Speed (if auto)	1600 rpm	1150 rpm	1600 rpm
Choke Setting (if auto)	See specification 13		set per specification 13
Hotspot Gap			
Governor No.			
Governor Speed A. No Load B. Fully Loaded	N A		N A
Distributor Type	Points		
Manufacturer & Serial No.	Delco 1112113		Delco 1112113
Vacuum Advance No.	C 3032		C 3032
Dwell	± 1 @ 1950 rpm		± 1 @ 1950 rpm
Timing Setting			
Primary Resistor Value	1.77 - 2.01		2.80
Total Advance Deg. RPM & In. Hg.	17° @ 2100 & 15		18° @ 2100 & 15
Vac. Adv. & Deg. Adv. 1. 2. 3. 4. 5. 6. 7.	550 - 0° 775 - 1° 1205 - 3° 1650 - 6° 2160 - 9°		550 - 0° 775 - 0.5° 1205 - 3 1650 - 5 2100 - 8

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TABLE E-3 (Cont'd). ENGINE 16 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1973 Manufacturer CHEVROLET Displacement 454 Engine No. 16

	Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv. 1. 2. 3. 4.	6° - 0° 15° - 10°		6° - 0° 15° - 10°
Spark Plugs Type & Manuf.	R44T - AC		R44T - AC
Spark Plug Gap	.035		.035
Spark Plug Torque (in lbs.)	15 ft-lbs		15 ft-lbs
Max. Engine Torque @ RPM	355 @ 2800		303 @ 2100
Max. Engine HP @ RPM	315 @ 4400		283 @ 3400
Flywheel Bolt Torque	110 ft-lb		110 ft-lb
Cylinder Compression 1. 2. 3. 4. 5. 6. 7. 8.	150(-20)	120 135 120 125 125 125* 120 120 *After Valve Replacement	

Comments: Valves 1 Turn Down
Head Bolts 80 ft. lb.

TABLE E-4. ENGINE 17 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1973 Manufacturer GMC Displacement 427 Engine No. 17

	Manufacturer Spec.	As Received	After Tune-up
Carburetor Type Manufacturer & Serial No.			
Fuel Pressure	7-9 lbs	--	7.5
Curb Idle Speed (engine oil over 200°F)	550	700	530
Fast Idle Speed (if auto)	--	-	-
Choke Setting (if auto)	--	-	-
Dashpot Gap	--	-	-
Governor No.	--	-	Replaced w. th. Un. #11
Governor Speed A. No Load B. Fully Loaded	4000 RPM	Not functioning	4000 rpm
Distributor Type	Delco Remy		
Manufacturer & Serial No.	1111365 (2K16)	1111365 (2K16)	1111365 (2K16)
Vacuum Advance No.	N.A.	N.A.	N.A.
Dwell	28-32		30°
Timing @ RPM	8° @ 550	7° @ 550	8° @ 550
Primary Resistor Valve	-	-	-
Total Advance @ RPM & In. Hg.	13 @ 3200	N.A.	13 @ 2200
Init. Adv. 1. RPM & Deg. Adv. 2. 3. 4. 5. 6. 7.	1 @ 600 rpm - Advance starts 13 @ 2200 rpm - Full advance	N.A.	1 at 600 rpm 13 at 2200 rpm

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TABLE E-4 (Cont'd). ENGINE 17 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1973 Manufacturer GMC Displacement 427 Engine No. 17

	Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv. 1. 2. 3. 4.	N.A.	N.A	N.A.
Spark Plugs Type & Manuf.	R44T AC	R42T AC	R44T AC
Spark Plug Gap	0.035	0.035	0.035
Spark Plug Torque (in lbs.)	15 ft. lbs.	— —	15 ft. lbs.
Max. Engine Torque @ RPM	360 @ 2800	270 @ 2800	320 @ 2800
Max. Engine HP @ RPM	230 @ 4000	154 @ 4000	203 @ 3800
Flywheel Bolt Torque	60 ft. lbs.	— —	60 ft. lbs.
Cylinder Compression 1. 2. 3. 4. 5. 6. 7. 8.	Lowest reading must be within 80% of highest reading.	110 110 100 100 125 110 100 120	N.A.
Idle Air/Fuel	50 rpm Lean Drop from 600 rpm	CO - 6.5%	Set using 50 rpm Lean Drop CO - 1.1 to 1.4

Comments:

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TABLE E-5. ENGINE 18 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1972 Manufacturer CHEVROLET Displacement 350 Engine No. 18

	Manufacturer Spec.	As Received	After Tune-up
Carburetor Type Manufacturer & Serial No.			
Fuel Pressure	7 to 8½	--	8
Curb Idle Speed (engine oil over 200°F)	600	--	600
Fast Idle Speed (if auto)	--	--	N.A
Choke Setting (if auto)	--	--	N A
Dashpot Gap	--	--	N.A.
Governor No.	N.A.	--	N.A.
Governor Speed A. No Load B. Fully Loaded	N.A.	N.A.	N.A.
Distributor Type	Delco Remy - Points	--	Delco Remy - Points
Manufacturer & Serial No.	1112047 (2A19)	1112047 (2A19)	1112047 (2A19)
Vacuum Advance No.	C-3036	--	--
Dwell	29° - 31°	--	30°
Timing @ RPM	8° @ 600 w. AT	--	8° @ 600
Primary Resistor Valve	1.77 - 2.01	--	1.83
Total Advance @ RPM & In. Hg.	33° @ 4200 + 15.5	--	31 @ 4200 + 15.5
Mech. Adv. & Deg. Adv. 1. 2. 3. 4. 5. 6. 7.	0° @ 865 2° @ 1335 11° @ 2400 18° @ 4200	--	0° @ 865 2° @ 1335 11° @ 2400 16° @ 4200

TABLE E-5 (Cont'd). ENGINE 18 TUNE-UP SPECIFICATIONS
CHECK LIST

M/Y 1972 Manufacturer CHEVROLET Displacement 350 Engine No. 18

	Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv. 1. 2. 3. 4.	0° @ 8" Hg 15° @ 15.5" Hg	--	1° @ 8" Hg 15° @ 15.5° Hg
Spark Plugs Type & Manuf.	R44T AC	R44T AC	R44T AC
Spark Plug Gap	.035	.035	.035
Spark Plug Torque (in lbs.)	15 ft. lbs	--	15 ft. lbs
Max. Engine Torque @ RPM	290 @ 2400	--	--
Max. Engine HP @ RPM	175 @ 4000	--	--
Flywheel Bolt Torque	60 ft. lbs	--	60 ft. lbs
Cylinder Compression 1.	Lowest readings must be within 80% of highest readings.	135	N.A.
2.		125	
3.		140	
4.		135	
5.		130	
6.		125	
7.		130	
8.		150	

*630 to 600 Lean Drop used for Idle Adjustment - Resultant CO was 2.0 to 2.4 %

Comments:

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TABLE E-6. ENGINE 19 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION

ENGINE MANUFACTURE IHC SERIAL NO. 1099236 DYNO Cell 2 DATE RECEIVED 1979

MODEL YEAR 1972 DISPLACEMENT 345 BLOCK CONFIGURATION ✓ NO. CYLINDERS 8

SOURCE of ENGINE TRUCK EXHAUST PIPE DIA. 3" RATED HP. 197 @ 4000 RPM

RATED MAX. T$_q$. 309 @ 2200 RPM OIL TYPE SE

Engine 19

MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
-SECONDARY IGNITION-		
A) INITIAL TIMING TDC @ 700 RPM on No. 8 Cylinder	____ DEG. @ ____ RPM	TCD DEG. @ 700 RPM.
B) MAG TIMING OFF SET N.A.	____	N.A.
C) MAX. COIL OUTPUT *1 28 KV. MIN.	____ KV.	24 KV.
D) MAX. OUTPUT VARIATION (SNAP ACCEL) 5K. MAX.	____ KV.	4 KV.
E) SPARK PLUG MANUFACTURE Champion	MANUFACTURE ____	MANUFACTURE Champion
TYPE J6 GAP .030 TQ 28-30	TYPE ____ GAP ____ TQ ____	TYPE J6 GAP .030 TQ 28-30
F) FIRING ORDER 18436572		
-ENGINE-		
A) OIL PRESS N.D. PSI @ 1500 RPM	____ PSI @ ____ RPM	38 PSI @ 1500 RPM
B) THERMOSTAT TEMP. N.A. 195°F		
C) ACTUAL MAX. TQ N.D. LB Ft. 2200 RPM	____ LB Ft. ____ RPM.	279 LB Ft. 2200 RPM
D) ACTUAL RATED HP N.D. 4000 RPM	____ LB FT. ____ RPM	152 4000 RPM
$\frac{HP \times 5252}{SPD.} = TQ$ N.D.	____ HP	—
E) FLY WHEEL BOLT TORQUE 45-55	TQ ____	TQ 55

*1 EXCEPT IF SPEC. IS NOTED AS LESS

TABLE E-6 (Cont'd). ENGINE 19 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION CONT.

F) COMPRESSION

*2 SPEC. 143 ± 10

New Low 80% of High in General Tune-Up Section

	FIRST	FIFTH	WET
1	—	125	
2	—	125	
3	—	120	
4	—	125	
5	—	125	
6	—	125	
7	—	115	
8	—	120	

H) RPM DROP PER. CYLINDER

1	
2	
3	
4	
5	
6	
7	
8	

I) CARB. BALANCE *4

1) ODD FIRING — RPM — %CO

2) EVEN FIRING — RPM — %CO

J) CHECK VAC. HOSE, FITTINGS ON CARB, & MANIFOLD VAC. LINES [✓] ok

K) CHECK ALL GASKETS AND REPLACE IF NESSARY (TAPPET, INTAKE, PAN, CARB. BASE. [✓] ok

L) LASH VALVES & TQ. HEAD BOLTS

VALVE SPEC. NONE HEAD BOLTS 90-100 TQ FT LB.

*2 IF NO SPEC. 80% of MAX.

*4 MAX. VARIATION of 10 to 20 RPM & CO CLOSE TO BEING THE SAME.

COMMENTS:

TABLE E-6 (Cont'd). ENGINE 19 TUNE-UP SPECIFICATIONS

DISTRIBUTOR INFORMATION**

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	N.D.		IHC
B) TYPE (ELEC, POINT, ETC. & GAP	POINTS - .019		.019
C) SERIAL NUMBER	— —		— —
D) MODEL NUMBER	433142	433142	433142
E) VACUUM ADVANCE NO.	N.D.		N.D.
F) DWELL	28-32 DEGREES	DEG.	30 DEG.
G) DWELL VARIATION	N.D. @ N.D. RPM	@ RPM	N.D. @ N.D. RPM
H) PRIMARY RESISTOR VALUE	N.D. Ω	Ω	1.8 Ω
I) POINT RESISTANCE	.25 VOLTS DC (OR) GOOD OR BAD	VOLTS DC	.06 VOLTS DC

J) MECHANICAL ADVANCE CURVE

	MANUFACTURER DISTRIBUTOR RPM	MANUFACTURER DISTRIBUTOR DEG.	MANUFACTURER ENGINE RPM	MANUFACTURER ENGINE DEG.	AS RECEIVED DISTRIBUTOR RPM	AS RECEIVED DISTRIBUTOR DEG.	AS RECEIVED ENGINE RPM	AS RECEIVED ENGINE DEG	AFTER TUNE UP DISTRIBUTOR RPM	AFTER TUNE UP DISTRIBUTOR DEG.	AFTER TUNE UP ENGINE RPM	AFTER TUNE UP ENGINE DEG.
1	400	0-1	800	0-2					300	0	600	0
2	900	4-6	1800	8-12					400	1	800	2
3	2000	15-17	4000	30-34					900	6	1800	12
4									2000	15	4000	30
5												
6												
7												
8												

K) VACUUM ADVANCE CURVE @ N.A. RPM

	MANUFACTURER DISTRIBUTOR "Hg	MANUFACTURER DISTRIBUTOR DEG.	MANUFACTURER ENGINE "Hg	MANUFACTURER ENGINE DEG.	AS RECEIVED DISTRIBUTOR "Hg	AS RECEIVED DISTRIBUTOR DEG.	AS RECEIVED ENGINE "Hg	AS RECEIVED ENGINE DEG.	AFTER TUNE UP DISTRIBUTOR "Hg	AFTER TUNE UP DISTRIBUTOR DEG.	AFTER TUNE UP ENGINE "Hg	AFTER TUNE UP ENGINE DEG
1	5-7	Start	5-7	Start					3	0	3	0
2	8.5	2-4	8.5	4-8					5	0	5	0
3									7	1	7	2
4									8.5	3	8.5	6
5												
6												
7												
8												

** From IH TRUCK SERVICE MANUAL for = Distributor Number 433142-C91

TABLE E-6 (Cont'd). ENGINE 19 TUNE-UP SPECIFICATIONS

CARBURETION INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	Holley	Holley	Holley
B) SERIAL NUMBER	N.D.		N.D.
C) MODEL NUMBER	454578-C91	151786-R99	454578-C91
D) LIST NUMBER	N.D.	1710 5S	6391-2
E) CARB. TYPE 1-2-4 VENTURRI	2		2
F) CURB IDLE: AUTO	N.A. RPM	A RPM	A N.A. RPM
F) CURB IDLE: MANUAL	700 *RPM	M RPM	M 700 RPM
G) THROTTLE KICKER: ENERGIZED	N.A. SET N.A.	ENERGIZED RPM. SET RPM	ENERGIZED N.A. RPM SET N.A. RPM
H) STEP UP SOLENOID: CONNECTED	N.A. RPM	CONNECTED RPM	CONNECTED N.A. RPM
H) STEP UP SOLENOID: DISCONNECTED	N.A. RPM	DISCONNECTED RPM	DISCONNECTED N.A. RPM
I) IDLE CO	*≈3% ② 700 RPM	CO % ② RPM	CO 1.4 % ② 700 RPM
I) IDLE HC	N.A. PPM *3 Turns Open	HC PPM	HC 200 PPM
J) POWER VALVE SETTING CO	START N.D. % FULL N.D. %	CO START % FULL %	CO START .3 % FULL 5.0 %
J) POWER VALVE SETTING ②	N.D. INCHES Hg N.D.	② INCHES Hg	② 1.5 INCHES Hg 2000 RPM
K) FUEL TYPE	N.A. ② 5.5 PSI	FUEL TYPE ② PSI	FUEL TYPE N.A. ② 5.6 PSI
L) NEEDLE SEAT LEAKDOWN	(GOOD, BAD)	(GOOD, BAD)	Good (GOOD, BAD)
L) VOLUME	PT. PER SEC.	VOLUME PT. PER SEC.	VOLUME — PT PER — SEC
M) GOVERNOR TYPE	None		N.A.
N) GOVERNOR SETTING NO LOAD	N.A. RPM	NO LOAD RPM	NO LOAD N.A. RPM
N) GOVERNOR SETTING FULL LOAD	N.A. RPM	FULL LOAD RPM	FULL LOAD N.A. RPM
O) CHOKE SETTING	Manual		Manual
P) FAST IDLE	N.A. RPM	RPM	N.A. RPM

COMMENTS:

*Based on 1973 Operator's manual - All other items based on MOTOR TRUCK & DIESEL REPAIR MANUAL

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TABLE E-7. ENGINE 20 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION

ENGINE MANUFACTURE [FORD] SERIAL NO. [F60BCN42126] DYNO [Cell 2] DATE RECEIVED [1979]

MODEL YEAR [1972] DISPLACEMENT [300] BLOCK CONFIGURATION [I] NO. CYLINDERS [6]

SOURCE of ENGINE [TRUCK] EXHAUST PIPE DIA. [2.5] RATED H.P. [165] @ [3600] RPM

RATED MAX. Tq. [294] @ [2000] RPM OIL TYPE [SE]

Engine 20

MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
-SECONDARY IGNITION-		
A) INITIAL TIMING [6°] @ [600] RPM	[ ] DEG. @ [ ] RPM	[6] DEG. @ [600] RPM.
B) MAG TIMING off SET [N.A.]	[—]	[—]
C) MAX. COIL OUTPUT *1 28 KV. MIN.	[ ] KV.	[20] KV.
D) MAX. OUTPUT VARIATION (SNAP ACCEL) 5K MAX.	[ ] KV.	[4] KV.
E) SPARK PLUG MANUFACTURE [Autolite]	MANUFACTURE [ ]	MANUFACTURE [ ]
TYPE [BF-42] GAP [.034] TQ [N.D.]	TYPE [ ] GAP [ ] TQ [ ]	TYPE [ ] GAP [.034] TO [20 FT LB]
F) FIRING ORDER [153624]		
-ENGINE-		
A) OIL PRESS [35-60] PSI @ [2000] RPM	[ ] PSI @ [ ] RPM	[45] PSI @ [2000] RPM
B) THERMOSTAT TEMP. [195]		
C) ACTUAL MAX. TQ [294] LB FT [2000] RPM	[ ] LB FT. [ ] RPM.	[218] LB FT. [2000] RPM
D) ACTUAL RATED HP [165] [3600] RPM	[ ] [ ] RPM	[120] HP [3600] RPM
$\frac{HP \times 5252}{SPD.}$ = TQ [241]	[ ]	[175]
E) FLY WHEEL BOLT TORQUE [75-85]	TQ [ ]	TQ [80]

*1 EXCEPT IF SPEC. IS NOTED AS LESS

TABLE E-7 (Cont'd). ENGINE 20 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION CONT.

F) COMPRESSION

*2 SPEC. [*]

± [ ]

* Lowest 75% of Highest

	FIRST	FIFTH	WET
1	95	120	
2	100	120	
3	95	115	
4	100	130	
5	100	130	
6	100	135	
7			
8			

H) RPM DROP PER. CYLINDER

1	
2	
3	
4	
5	
6	
7	
8	

I) CARB. BALANCE *4

1) ODD FIRING [ ] RPM [ ] %CO

2) EVEN FIRING [ ] RPM [ ] %CO

J) CHECK VAC. HOSE, FITTINGS ON CARB, & MANIFOLD VAC. LINES [ ] ok

K) CHECK ALL GASKETS AND REPLACE IF NESSARY (TAPPET, INTAKE, PAN, CARB. BASE. [ ] ok

L) LASH VALVES & TQ. HEAD BOLTS

VALVE SPEC. [.100 to .130] HEAD BOLTS [60-70] TQ FT LB.

*2 IF NO SPEC. 80% of MAX.

*4 MAX. VARIATION OF 10 TO 20 RPM & CO CLOSE TO BEING THE SAME.

COMMENTS:

Engine as-received did not have an air cleaner or a thermostat.

TABLE E-7 (Cont'd). ENGINE 20 TUNE-UP SPECIFICATIONS

DISTRIBUTOR INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	MOTORCRAFT	MOTORCRAFT	MOTORCRAFT
B) TYPE (ELEC, POINT, ETC.)	POINT - .027		.027
C) SERIAL NUMBER	N.D		N.D.
D) MODEL NUMBER	D2TF 12127EA	D3TF 12127 GA	C9TZ-12127-FRM on Box C6TF-12127-A on Unit
E) VACUUM ADVANCE NO.	N.D.	N.D.	N.D. * Same unit from as received distributor (it required same rework as the rebuilt unit.)
F) DWELL	35-39 DEGREES	DEG.	37 DEG.
G) DWELL VARIATION	N.D. @ N.D. RPM	@ RPM	N.D. @ N.D. RPM
H) PRIMARY RESISTOR VALVE	1.30-1.90 Ω	Ω	1.4 Ω.
I) POINT RESISTANCE	0.25 VOLTS DC MAX. (OR) GOOD OR BAD	VOLTS DC	0.21 VOLTS DC

J) MECHANICAL ADVANCE CURVE

	MANUFACTURER DISTRIBUTOR "Hg	MANUFACTURER DISTRIBUTOR DEG.	MANUFACTURER ENGINE "Hg	MANUFACTURER ENGINE DEG.	AS RECEIVED DISTRIBUTOR RPM	AS RECEIVED DISTRIBUTOR DEG.	AS RECEIVED ENGINE RPM	AS RECEIVED ENGINE DEG	AFTER TUNE UP DISTRIBUTOR RPM	AFTER TUNE UP DISTRIBUTOR DEG.	AFTER TUNE UP ENGINE RPM	AFTER TUNE UP ENGINE DEG.
1	500	0-½			500	1			500	½		
2	1000	4½-6½			1000	7			1000	5		
3	1500	6-8½			1500	8½			1500	6½		
4	2000	7½-10			2000	10			2000	8		
5	750	1-3			250	Set 0			750	2		
6	250	Set 0							250	Set 0		
7												
8												

K) VACUUM ADVANCE CURVE @ N.A. RPM

	MANUFACTURER DISTRIBUTOR "Hg	MANUFACTURER DISTRIBUTOR DEG.	MANUFACTURER ENGINE "Hg	MANUFACTURER ENGINE DEG.	AS RECEIVED DISTRIBUTOR "Hg	AS RECEIVED DISTRIBUTOR DEG.	AS RECEIVED ENGINE DEG.	AFTER TUNE UP DISTRIBUTOR "Hg	AFTER TUNE UP DISTRIBUTOR DEG.	AFTER TUNE UP ENGINE "Hg	AFTER TUNE UP ENGINE DEG
1	5	4½			5	4		5	2		
2	10	6-9			10	7		10	6		
3	15	10-13			15	12		15	10		
4	20	12-13			20	12		20	10		
5	0	0			0	0		0	0		
6											
7											
8											

TABLE E-7 (Cont'd). ENGINE 20 TUNE-UP SPECIFICATIONS

CARBURETION INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	--	CARTER for MOTORCRAFT	CARTER for MOTORCRAFT
B) SERIAL NUMBER	N.A.	N.A.	N.A.
C) MODEL NUMBER	C9TF-F (9510)	YF 6425 S	D2HF KA or Silver Tag (D2TZ-9510-AA Carb. Repl. etc.)
D) LIST NUMBER	9510	--	9510
E) CARB TYPE 1-2-4 VENTURRI	1	1	1
F) CURB IDLE: AUTO	N.A. RPM	A -- RPM	A -- RPM
F) CURB IDLE: MANUAL	600 RPM	M -- RPM	M 600 RPM
G) THROTTLE KICKER ENERGIZED	N.A. SET N.A.	ENERGIZED -- RPM. SET -- RPM	ENERGIZED N.A. RPM SET N.A. RPM
H) STEP UP SOLENOID: CONNECTED	N.A. RPM	CONNECTED -- RPM	CONNECTED N.A. RPM
H) STEP UP SOLENOID: DISCONNECTED	N.A. RPM	DISCONNECTED -- RPM	DISCONNECTED N.A. RPM
I) IDLE CO	No Spec % @ N.A. RPM	CO -- % @ -- RPM	CO ≈3.0 % @ 600 RPM
I) IDLE HC	No Spec PPM	HC -- PPM	HC 1600* PPM as Hex ane
J) POWER VALVE SETTING CO START	No Spec % FULL No Spec %	CO START -- % FULL --	CO START .4 % FULL 3.2
J) POWER VALVE SETTING @	N.A. INCHES Hg N.A.	@ -- INCHES Hg --	@ 3 INCHES Hg 2
K) FUEL TYPE	N.A. @ 4½-6½ PSI	FUEL TYPE -- @ -- PSI	FUEL TYPE N.A. @ 5½ PSI
L) NEEDLE SEAT LEAK DOWN	No Spec (GOOD, BAD)	-- (GOOD, BAD)	Good (GOOD, BAD)
L) VOLUME	N.A. PT. PER N.A. SEC.	VOLUME -- PT. PER -- SEC.	VOLUME -- PT PER -- SEC
M) GOVERNOR TYPE	N.A.	--	N.A.
N) GOVERNOR SETTING NO LOAD	N.A. RPM	NO LOAD -- RPM	NO LOAD N.A. RPM
N) GOVERNOR SETTING FULL LOAD	N.A. RPM	FULL LOAD -- RPM	FULL LOAD N.A. RPM
O) CHOKE SETTING	MANUAL	--	MANUAL
P) FAST IDLE	1400 RPM	-- RPM	N.A. RPM
Q) DASHPOT SETTING	7/64 to 1/8		1/8

COMMENTS:

* 1400 ppm was lowest HC attainable. Was attained with increase in CO. HC increased rapidly as CO was decreased below 2.5%

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TABLE E-8. ENGINE 21 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION

PAGE 1 of 4

ENGINE MANUFACTURE [IHC] SERIAL NO. [1304A10726] DYNO [2] DATE RECEIVED [JAN/22/80]

MODEL YEAR [73] DISPLACEMENT [304] BLOCK CONFIGURATION [V] NO. CYLINDERS [8]

SOURCE of ENGINE [EGEG-AF] EXHAUST PIPE DIA. [ ] RATED H.P.[a] [147] @ [3900] RPM

RATED MAX. Tq.[a] [240] @ [2400] RPM OIL TYPE [SE]

Engine 21

MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
-SECONDARY IGNITION-		
A) INITIAL TIMING [TDC] @ [700] RPM on Cyl. #8	[ ] DEG. @ [ ] RPM	[TDC] DEG. @ [700] RPM.
B) MAG TIMING OFFSET [N.A.]	[ ]	[N.A.]
C) MAX. COIL OUTPUT *1 28 KV. MIN.	[ ] KV.	[32] KV.
D) MAX. OUTPUT VARIATION (SNAP ACCEL) 5K MAX.	[ ] KV.	[5] KV.
E) SPARK PLUG MANUFACTURE [Champion]	MANUFACTURE [ ]	MANUFACTURE [CHAMPION]
TYPE [J6] GAP [.030] TQ [28-32]	TYPE [ ] GAP [ ] TQ [ ]	TYPE [J-6] GAP [.030] TQ [30]
F) FIRING ORDER [18436572]		
-ENGINE-		
A) OIL PRESS [N.D.] PSI @ [1500] RPM	[ ] PSI @ [ ] RPM	[40] PSI @ [1500] RPM
B) THERMOSTAT TEMP. [N.D.] Vs		
C) ACTUAL MAX. TQ [240] LB Ft [2400] RPM	[ ] LB Ft. [ ] RPM.	[218] LB Ft. [2400] RPM
D) ACTUAL RATED HP [147] [3900] RPM	[ ] [ ] RPM	[124] [3900] RPM
$\frac{HP \times 5252}{SPD.}$ = TQ [198]	[ ] HP	[167]
E) FLY WHEEL BOLT TORQUE [45-55]	TQ [ ]	TQ [50]

*1 EXCEPT IF SPEC. IS NOTED AS LESS

[a] FROM MOTOR TRUCK AND DIESEL REPAIR MANUAL

TABLE E-8 (Cont'd). ENGINE 21 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION CONT.

F) COMPRESSION

*2 SPEC. 145 ± 10

	FIRST	FIFTH	WET
1	100	125	
2	100	125	
3	100	130	
4	100	135	
5	100	135	
6	100	130	
7	100	130	
8	100	130	

H) RPM DROP PER. CYLINDER

1	
2	
3	
4	
5	
6	
7	
8	

I) CARB. BALANCE *4

1) ODD FIRING ____ RPM ____ %CO

2) EVEN FIRING ____ RPM ____ %CO

J) CHECK VAC. HOSE, FITTINGS ON CARB, &MANIFOLD VAC. LINES [✓] ok

K) CHECK ALL GASKETS AND REPLACE IF NESSARY (TAPPET, INTAKE, PAN, CARB. BASE. [✓] ok

L) LASH VALVES & TQ. HEAD BOLTS IF NESSARY. N/A [✓]

VALVE SPEC. Zero HEAD BOLTS 90-100 TQ FT LB.

*2 IF NO SPEC. 80% of MAX.

*4 MAX. VARIATION OF 10 TO 20 RPM & CO CLOSE TO BEING THE SAME.

COMMENTS:

TABLE E-8 (Cont'd). ENGINE 21 TUNE-UP SPECIFICATIONS

DISTRIBUTOR INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	N. D.		N.D.
B) TYPE (ELEC, POINT, ETC.	POINT		POINT
C) SERIAL NUMBER	- -		- -
D) MODEL NUMBER	428095-C91		428095-C91
E) VACUUM ADVANCE NO.	N.D.		N.D.
F) DWELL	27-32 DEGREES .019 GAP	DEG.	30 DEG. .019 GAP
G) DWELL VARIATION	N.D. @ N.D. RPM	@ RPM	N.D. @ N.D RPM
H) PRIMARY RESISTOR VALUE	N.D. Ω	Ω	1.6 Ω
I) POINT RESISTANCE	11-.25 VOLTS DC (OR) GOOD OR BAD	VOLTS DC	.20 VOLTS DC

J) MECHANICAL ADVANCE CURVE

	MANUFACTURER DIST. RPM	MANUFACTURER DIST. DEG.	MANUFACTURER ENGINE RPM	MANUFACTURER ENGINE DEG.	AS RECEIVED DIST. RPM	AS RECEIVED DIST. DEG.	AS RECEIVED ENGINE RPM	AS RECEIVED ENGINE DEG	AFTER TUNE UP DIST. RPM	AFTER TUNE UP DIST. DEG.	AFTER TUNE UP ENGINE RPM	AFTER TUNE UP ENGINE DEG.
1	100	0							350	0		
2	400	4 1							400	½		
3	1100	9-11							1100	11		
4	2000	15-17							2000	15		
5												
6												
7												
8												

K) VACUUM ADVANCE CURVE (2) N.D. RPM

	MANUFACTURER "Hg	MANUFACTURER DEG.	MANUFACTURER ENGINE "Hg	MANUFACTURER ENGINE DEG.	AS RECEIVED DIST.	AS RECEIVED DIST. DEG.	AS RECEIVED ENGINE	AS RECEIVED ENGINE DEG	AFTER TUNE UP DIST. "Hg	AFTER TUNE UP DIST. DEG.	AFTER TUNE UP ENGINE "Hg	AFTER TUNE UP ENGINE DEG
1	3	0							3	0		
2	5	St. T							5	St. T.		
3	7	St. T							7	½		
4	11	2-4							11	4		
5												
6												
7												
8												

From THC TRUCK SERVICE MANUAL - CTS-9921-K

TABLE E-8 (Cont'd). ENGINE 21 TUNE-UP SPECIFICATIONS

CARBURETION INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	HOLLEY	HOLLEY	HOLLEY
B) SERIAL NUMBER	--	--	--
C) MODEL NUMBER	427908-C9 Per Tim Cox 3/5/80	427908-C9	427908-C9
D) LIST NUMBER	N.D.		6394-1
E) CARB. TYPE 1-2-4 VENTURRI	2		2
F) CURB IDLE: AUTO	-- RPM	A RPM	A -- RPM
F) CURB IDLE: MANUAL	700 RPM	M RPM	M 700 RPM
G) THROTTLE KICKER: ENERGIZED	N.A. SET N.A.	ENERGIZED RPM. SET RPM	ENERGIZED N.A. RPM SET N.A. RPM
H) STEP UP SOLENOID: CONNECTED	N.A. RPM	CONNECTED RPM	CONNECTED N.A. RPM
H) STEP UP SOLENOID: DISCONNECTED	N.A. RPM	DISCONNECTED RPM	DISCONNECTED N.A. RPM
I) IDLE CO	2.0 % @ 700 RPM	CO 8 % @ 700 RPM	CO Set 1.5 % @ 700 RPM
I) IDLE HC	N.A. PPM Per Tag on the Engine	HC 2000+ PPM** Problems	HC 250 PPM ***
J) POWER VALVE SETTING CO	START N.D. % FULL N.D. %	CO START % FULL	CO START -- % FULL --
J) POWER VALVE SETTING @	N.D. INCHES Hg N.D.	@ INCHES Hg	@ -- INCHES Hg --
K) FUEL TYPE	N.A. @ 5.0 PSI	FUEL TYPE @ PSI	FUEL TYPE -- @ 6.0 PSI
L) NEEDLE SEAT LEAKDOWN	N.D. (GOOD, BAD)	(GOOD, BAD)	✓ (GOOD, BAD)
L) VOLUME	N.D. PT. PER N.D. SEC.	VOLUME PT. PER SEC.	VOLUME -- PT PER -- SEC
M) GOVERNOR TYPE	N.A.		N.A.
N) GOVERNOR SETTING NOLOAD	N.A. RPM	NOLOAD RPM	NOLOAD N.A. RPM
N) GOVERNOR SETTING FULL LOAD	N.A. RPM	FULL LOAD RPM	FULL LOAD N.A. RPM
O) CHOKE SETTING	N.D.		N.A.
P) FAST IDLE	N.D. Use 1500 RPM	RPM	N.A RPM

COMMENTS:

* Based on 1973 IHC Operator's Manual
** External and internal fuel leaks. Bowl gasket and an O'ring were bad.
*** Idle mixture was very sensitive to small changes in adjustment of the mixture screws.

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TABLE E-9. ENGINE 22 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION

ENGINE MANUFACTURE GMC SERIAL NO. T0X18T0A DYNO 2 DATE RECEIVED N.D.

MODEL YEAR 73 DISPLACEMENT 366 BLOCK CONFIGURATION V NO. CYLINDERS 8

SOURCE of ENGINE TRUCK-EXA EXHAUST PIPE DIA. [ ] RATED H.P. 200[a] @ 4000 RPM

RATED MAX. Tq. 310[a] @ 2800 RPM OIL TYPE SE

Engine 22

MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
-SECONDARY IGNITION-		
A) INITIAL TIMING 8 @ 550 RPM	[ ] DEG. @ [ ] RPM	8 DEG. @ 550 RPM.
B) MAG TIMING OFF SET N.A.	[ ]	N.A.
C) MAX. COIL OUTPUT *1 28 Kv. MIN.	[ ] KV.	20 KV.
D) MAX. OUTPUT VARIATION (SNAP ACCEL) 5K. MAX.	[ ] KV.	3 KV.
E) SPARK PLUG MANUFACTURE AC	MANUFACTURE [ ]	MANUFACTURE AC
TYPE R-43T[b] GAP .035 TQ 15	TYPE [ ] GAP [ ] TQ [ ]	TYPE R43T GAP .035 TO 15 FT-LB
F) FIRING ORDER 1 8 4 3 6 5 7 2		
-ENGINE-		
A) OIL PRESS N.D. PSI @ N.D. RPM	[ ] PSI @ [ ] RPM	48 PSI @ 2000 RPM
B) THERMOSTAT TEMP. 180°F		
C) ACTUAL MAX. TQ 310[a] LB FT 2800 RPM	[ ] LB FT. [ ] RPM.	285 LB FT. 2800 RPM
D) ACTUAL RATED HP 200[a] 4000 RPM	[ ] [ ] RPM	234 HP 4000 RPM
$\frac{HP \times 5252}{SPD.} = TQ$ 268	[ ]	307
E) FLY WHEEL BOLT TORQUE 60-70	TQ [ ]	TQ [ ] LB FT

*1 EXCEPT IF SPEC. IS NOTED AS LESS

[a] Per MOTOR MANUAL [b] Per Chevrolet 1973 M.D. Service Manual - Ign. Sys. 6Y-46

TABLE E-9 (Cont'd). ENGINE 22 TUNE-UP SPECIFICATIONS

ENGINE INFORMATION CONT.

F) COMPRESSION

*2 SPEC. [--] ± [--]

Use Lowest 75% of Highest

	FIRST	FIFTH	WET
1	110	120	
2	95	130	
3	90	115	
4	100	125	
5	100	120	
6	100	125	
7	95	135	
8	100	120	

H) RPM DROP PER. CYLINDER

1	
2	
3	
4	
5	
6	
7	
8	

I) CARB. BALANCE *4

1) ODD FIRING [ ] RPM [ ] %CO

2) EVEN FIRING [ ] RPM [ ] %CO

J) CHECK VAC. HOSE, FITTINGS ON CARB, & MANIFOLD VAC. LINES [✓] ok

K) CHECK ALL GASKETS AND REPLACE IF NESSARY (TAPPET, INTAKE, PAN, CARB. BASE. [✓] ok

L) LASH VALVES & TQ. HEAD BOLTS IF NESSARY. N/A [✓]

VALVE SPEC. [1 Turn] HEAD BOLTS [60-65] TQ FT LB.

*2 IF NO SPEC. 80% of MAX.

*4 MAX. VARIATION of 10 to 20 RPM & CO CLOSE TO BEING THE SAME.

COMMENTS:

TABLE E-9 (Cont'd). ENGINE 22 TUNE-UP SPECIFICATIONS

DISTRIBUTOR INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	Delco-Remy		Delco - Remy
B) TYPE (ELEC, POINT, ETC.	POINT		— —
C) SERIAL NUMBER	— —		— —
D) MODEL NUMBER	1111365		1111365
E) VACUUM ADVANCE NO.	N.A.		N.A.
F) DWELL	28-32 DEGREES	N.S. GAP	DEG.	30 DEG. N.S. GAP
G) DWELL VARIATION	N.D. @ N.D. RPM	@ RPM	N.D. @ N.D. RPM
H) PRIMARY RESISTOR VALVE	1.30-1.90 Ω	Ω	1.30 Ω
I) POINT RESISTANCE	Lo 0.15 VOLTS DC (OR) GOOD OR BAD	VOLTS DC	0.21 VOLTS DC

J) MECHANICAL ADVANCE CURVE

	MANUFACTURER SPECIFICATIONS				AS RECEIVED				AFTER TUNE UP			
	DISTRIBUTOR		ENGINE		DISTRIBUTOR		ENGINE		DISTRIBUTOR		ENGINE	
	RPM	DEG.	RPM	DEG.	RPM	DEG.	RPM	DEG	RPM	DEG.	RPM	DEG.
1	300	0							300	0		
2	625	0-7							500	1		
3	1200	7.5-25							1200	8.5		
4	2200	12-[illegible]							2200	13		
5												
6												
7												
8												

K) VACUUM ADVANCE CURVE @ N.A. RPM

	MANUFACTURER SPECIFICATIONS				AS RECEIVED				AFTER TUNE UP			
	DISTRIBUTOR		ENGINE		DISTRIBUTOR		ENGINE		DISTRIBUTOR		ENGINE	
	"Hg	DEG.	"Hg	DEG.	RPM	DEG.	RPM	DEG	RPM	DEG.	RPM	DEG
1	N.A.								N.A.	N.A.		
2												
3												
4												
5												
6												
7												
8												

TABLE E-9 (Cont'd). ENGINE '22 TUNE-UP SPECIFICATIONS

CARBURETION INFORMATION

	MANUFACTURER SPECIFICATIONS	AS RECEIVED	AFTER TUNE UP
A) MANUFACTURER	—	HOLLEY	HOLLEY
B) SERIAL NUMBER	—	—	—
C) MODEL NUMBER	—	6855981	6855981
D) LIST NUMBER	—	6292 *	6292 *
E) CARB. TYPE 1-2-4 VENTURRI	N.L.		4
F) CURB IDLE: AUTO	550 RPM	A RPM	A — RPM
F) CURB IDLE: MANUAL	550 RPM	M RPM	M 550 RPM
G) THROTTLE KICKER } ENERGIZED	N.A. SET N.A.	ENERGIZED RPM. SET RPM	ENERGIZED — RPM SET — RPM
H) STEP UP SOLENOID: CONNECTED	550 RPM	CONNECTED RPM	CONNECTED N.A. RPM
H) STEP UP SOLENOID: DISCONNECTED	450 RPM	DISCONNECTED RPM	DISCONNECTED N.A. RPM
I) IDLE CO	— % ② — RPM	CO % ② RPM	CO 1.6 % ② 550 RPM
I) IDLE HC	— PPM 50 RPM Lean Drop	HC PPM	HC N.D. PPM
J) POWER VALVE SETTING CO START	N.D. %	CO START %	CO START — %
J) POWER VALVE SETTING CO FULL	N.D. %	FULL	FULL —
J) POWER VALVE SETTING ②	N.D. INCHES Hg N.D.	② INCHES Hg	② — INCHES Hg —
K) FUEL TYPE	N.A. ② 7-9 PSI	FUEL TYPE ② PSI	FUEL TYPE N.A. ② 7.5 PSI
L) NEEDLE SEAT LEAKDOWN	N.D. (GOOD, BAD)	(GOOD, BAD)	V (GOOD, BAD)
L) VOLUME	N.D. PT. PER N.D. SEC.	VOLUME PT. PER SEC.	VOLUME — PT PER — SEC
M) GOVERNOR TYPE	—		—
N) GOVERNOR SETTING NO LOAD	≈4900 RPM	NO LOAD RPM	NO LOAD — RPM
N) GOVERNOR SETTING FULL LOAD	4000 RPM	FULL LOAD RPM	FULL LOAD 4080 RPM
O) CHOKE SETTING	N.S.		Not Used
P) FAST IDLE	1800-2400 RPM	RPM	N.A. RPM

COMMENTS:

*According to MOTOR TRUCK AND DIESEL REPAIR MANUAL-6292 is a 1972 model
Unit accepted based on 2/5/80 telecon from Tim Cox-EPA

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TABLE E-10. ENGINE 11 TUNE-UP SPECIFICATIONS

CHECK LIST

M/Y 1973 Manufacturer GMC Displacement 366 Engine No. 11*

	Manufacturer Spec.	As Received	After Tune-up
Carburetor Type Manufacturer & Serial No.	4-BBL HOLLEY -625181 LIST 6272.		
Fuel Pressure	7-9 PSI		
Curb Idle Speed (engine oil over 200°F)	HOT IDLE SPEED 550 RPM	765	
Fast Idle Speed (if auto)	manual		
Choke Setting (if auto)	manual		
Dashpot Gap	none		
Governor No.			
Governor Speed A. No Load B. Fully Loaded	4000		
Distributor Type			
Manufacturer & Serial No.	Delco-Remy 1111365		
Vacuum Advance No.			
Dwell	28-32	27	
Timing @ RPM	80	14°	
Primary Resistor Valve			
Total Advance @ RPM & In. Hg.			
Mech. Adv. RPM & Deg. Adv. 1. 2. 3. 4. 5. 6. 7.	1° at 625 130 at 2200	1° - 450 3° - 625 8° - 1000 9° - 1200 10° - 1500 10° - 1800 11° - 2000 12° - 2200	

TABLE E-10 (Cont'd). ENGINE 11 TUNE-UP SPECIFICATIONS

CHECK LIST

M/Y 1973 Manufacturer GMC Displacement 366 Engine No. 11

	Manufacturer Spec.	As Received	After Tune-Up
Vac. Adv. Curve In. Hg. & Deg. Adv. 1. 2. 3. 4.	None		
Spark Plugs Type & Manuf.	R44T AC	R45T AC	
Spark Plug Gap	.035	.035	
Spark Plug Torque (in lbs.)	15 ft lbs.		
Max. Engine Torque @ RPM	310 at 2800		
Max. Engine HP @ RPM	200 at 4000		
Flywheel Bolt Torque	60 ft. lbs.		
Cylinder Compression 1. 2. 3. 4. 5. 6. 7. 8.	150 ± 20 psi	128 146 130 127 125 130 130 142	

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Comments: * Engine 11 was subsequently relesled as Engine 22.

APPENDIX F

TEST RESULTS ON NEW ENGINES

Engines 1, 6[a], 7, 8[a] and 10

Table Number	Description
F-1 thru F-5	Summary of Results
F-6 thru F-10	Transient Test Computer Printouts
F-11 thru F-15	Nine-Mode Computer Printouts

[a]Engines 6 and 8 are repeat tests of Engine 1

TABLE F-1. ENGINE 1 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE

		TEST 1-8			TEST 1-9			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	8.02	3.32	3.99	7.98	3.25	3.93	3.96
CO,	g/kW-hr	127.12	88.96	94.41	130.00	91.37	96.89	95.65
CO_2,	g/kW-hr	1152.	1147.	1148.	1176.	1144.	1149.	1149.
NOX,	g/kW-hr	7.33	7.60	7.60	7.13	7.68	7.60	7.60
SFC,	kg/kW-hr	0.434	0.409	0.413	0.443	0.409	0.414	0.414
WORK,	kW-hr	8.28	8.60	8.63	8.74	8.55	8.58	8.61
POWER,	kW	27.21	26.53	26.62	26.96	26.38	26.47	26.56

NINE MODE

		Test 1-11	Test 1-13	Average
HC,	g/kW-hr	1.863	1.798	1.831
CO,	g/kW-hr	46.605	43.678	45.142
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	6.972	7.130	7.051
SFC,	kg/kW-hr	0.460	0.459	0.460
		--	--	--

ENGINE DESCRIPTION

Engine: 1978 IHC 404 CID V-8 S/N 404-053483
Rated Power: 189 Hp @ 3600 rpm
Rated Torque: 323 ft-lbs @ 2200 rpm
Measured Idle Speed: 545 rpm

TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr	(g/hp-hr)	3.96 (2.95)	HC	9.57	3.28
CO,	g/kW-hr	(g/hp-hr)	95.65 (71.33)	CO	39.60	79.11
NOX,	g/kW-hr	(g/hp-hr)	7.60 (5.67)	NOX	18.36	6.29
SFC,	kg/kW-hr	(lb/hp-hr)	0.414 (0.681)	FUEL CONS.	-	342.
WORK,	kW-hr	(hp-hr)	8.61 (11.55)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE F-1 (Cont'd). ENGINE 1 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE MODAL RESULTS[b]

	Cold Cycle				Hot Cycle			
Test 1-8	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	37.49	21.19	8.58	3.48	7.75	8.40	8.06	4.34
CO, gram	362.42	301.38	348.54	108.81	109.75	193.80	354.41	106.63
CO_2, gram	1215.3	2221.0	5656.7	1067.9	1068.1	2091.7	5608.8	1093.3
NOX, gram	3.98	9.37	46.82	4.45	4.68	10.06	46.18	4.77
FUEL, kg	0.600	0.871	1.964	0.394	0.399	0.764	1.952	0.403
KW-HR	0.91	1.77	5.35	0.79	0.79	1.71	5.30	0.79
TEST 1-9								
HC, gram	36.29	20.70	8.82	3.94	6.87	8.59	8.13	4.18
CO, gram	349.06	288.47	385.06	113.23	114.87	194.82	354.94	116.94
CO_2 gram	1183.0	2382.6	5627.8	1077.8	1059.7	2097.2	5534.5	1096.0
NOX, gram	3.72	9.88	44.41	4.32	4.61	10.11	46.63	4.33
FUEL, kg	0.582	0.915	1.974	0.400	0.398	0.766	1.929	0.408
KW-HR	0.90	1.75	5.30	0.78	0.77	1.70	5.30	0.78

POWER MAPPING (TQ in ft-lb) @ Temp. - 78° Baro. - 29.10

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	273	2100	291	3100	262	4100	
-		1200	275	2200	291	3200	255	4200	
-		1300	277	2300	291	3300	249	4300	
400	212	1400	279	2400	291	3400	243	4400	
500	254	1500	282	2500	289	3500	237	4500	
600	260	1600	285	2600	287	3600	231	4600	
700	258	1700	288	2700	285	3700	-	4700	
800	258	1800	289	2800	282	3800		4800	
900	263	1900	291	2900	277	3900		4900	
1000	268	2000	291	3000	269	4000		5000	

[b]Barometric Pressure: Test 1-8 = 735 mm Hg Test 1-9 = 734 mm Hg.

TABLE F-2. ENGINE 6 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE

		TEST 6-3			TEST 6-4			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	8.21	5.02	5.48	10.12	5.84	6.45	5.97
CO,	g/kW-hr	128.93	96.44	101.08	146.40	97.81	104.75	102.92
CO_2,	g/kW-hr	1070.	1060.	1061.	1118.	1097.	1100.	1081.
NOX,	g/kW-hr	7.33	8.22	8.09	7.24	9.07	8.81	8.45
SFC,	kg/kW-hr	0.409	0.387	0.390	0.435	0.400	0.405	0.398
WORK,	kW-hr	9.11	8.96	8.98	8.81	8.61	8.64	8.81
POWER,	kW	28.19	27.64	27.71	27.18	26.56	26.65	27.18
KW-HR DEV.[b]		5.9	4.2	--	2.3	0.0	--	--

NINE MODE

	Test 6-3	Test 6-4	Average
HC, g/kW-hr	1.704	1.446	1.575
CO, g/kW-hr	43.194	40.632	41.913
CO_2, g/kW-hr	--	--	--
NOX, g/kW-hr	8.354	8.698	8.526
SFC, kg/kW-hr	0.391	0.389	0.390

ENGINE DESCRIPTION

Engine: 1978 IHC 404 CID V-8 S/N 404-053483
Rated Power: 189 hp at 3600 rpm
Rated Torque: 323 ft-lbs at 2200 rpm
Measured Idle Speed: 545 rpm

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	5.97	(4.45)	HC	15.00	5.05
CO,	g/kW-hr (g/hp-hr)	102.92	(76.75)	CO	258.59	87.10
NOX,	g/kW-hr (g/hp-hr)	8.45	(6.30)	NOX	21.23	7.15
SFC,	kg/kW-hr (lb/hp-hr)	0.398	(0.655)	FUEL CONS.	--	337.
WORK,	kW-hr (hp-hr)	8.81	(11.81)			

[a] Using a composite value of 10.41 km for the Transient Cycle.
[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.

TABLE F-2 (Cont'd). ENGINE 6 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE MODAL RESULTS [c]

	Cold Cycle				Hot Cycle			
TEST 6-3	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	25.72	27.42	13.86	7.81	12.00	15.61	9.64	7.76
CO, gram	242.57	314.24	513.06	104.99	139.41	217.62	405.83	101.29
CO_2, gram	1183.1	2079.0	5485.2	1002.8	976.5	1997.2	5509.1	1017.3
NOX, gram	2.82	10.86	47.42	5.67	4.38	11.94	51.68	5.62
FUEL, kg	0.519	0.838	1.997	0.376	0.389	0.753	1.947	0.379
KW-HR	0.82	1.78	5.77	0.75	0.72	1.72	5.78	0.73
TEST 6-4								
HC, gram	22.25	37.68	20.00	9.17	13.74	16.70	11.61	8.23
CO, gram	232.73	412.18	549.90	100.68	146.38	213.19	377.88	104.20
CO_2, gram	1175.0	2169.9	5521.0	983.6	955.9	2005.9	5436.5	1046.0
NOX, gram	2.76	11.05	44.39	5.61	4.06	12.94	54.98	6.09
FUEL, kg	0.508	0.926	2.030	0.369	0.388	0.755	1.913	0.390
KW-HR	0.73	1.79	5.57	0.71	0.69	1.66	5.54	0.71

F-5

POWER MAPPING (TQ in ft-lb) @ Temp. - 80 F Baro. - 29.11 In. Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	274	2100	300	3100	272	4100	
-		1200	277	2200	300	3200	267	4200	
-		1300	281	2300	299	3300	261	4300	
400	209	1400	285	2400	298	3400	255	4400	
500	255	1500	288	2500	296	3500	249	4500	
600	266	1600	291	2600	293	3600	242	4600	
700	267	1700	294	2700	290	3700	236	4700	
800	265	1800	296	2800	286	3800	231	4800	
900	267	1900	298	2900	282	3900	225	4900	
1000	270	2000	299	3000	277	4000	220	5000	

[c]Barometric Pressure: Test 6-3 = 753 mm Hg Test 6-4 = 749 mm Hg.

TABLE F-3. ENGINE 7 SUMMARY OF RESULTS
1978 Chevrolet 454

TRANSIENT CYCLE

		TEST 7-2			TEST 7-3			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	6.21	2.79	3.28	7.46	2.68	3.36	3.32
CO,	g/kW-hr	80.13	68.52	70.18	75.85	65.24	66.76	68.47
CO_2,	g/kW-hr	1070.	1096.	1092.	1069.	1019.	1026.	1059.
NOX,	g/kW-hr	9.24	8.95	8.99	8.65	8.39	8.43	8.71
SFC,	kg/kW-hr	0.383	0.382	0.382	0.382	0.356	0.360	0.371
WORK,	kW-hr	9.86	10.45	10.37	10.30	10.66	10.61	10.49
POWER,	kW	30.42	32.24	31.98	31.78	32.89	32.73	32.36
KW-HR DEV.[b]		-5.4	0.2	--	-1.2	2.3	--	--

NINE MODE

		Test 7-1	Test 7-2	Average
HC,	g/kW-hr	0.787	0.731	0.759
CO,	g/kW-hr	27.021	26.069	26.545
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	7.617	7.998	7.808
SFC,	kg/kW-hr	0.386	0.402	0.394

ENGINE DESCRIPTION

Engine: 1978 Chevrolet 454 CID S/N 364776
Rated Power: 240 hp at 3800 rpm
Rated Torque: 370 ft-lbs at 2800 rpm
Measured Idle Speed: 680 rpm

TRANSIENT CYCLE AVERAGE VALUES

				g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	3.32	2.48	8.95	3.35
CO,	g/kW-hr (g/hp-hr)	68.47	51.06	184.56	69.00
NOX,	g/kW-hr (g/hp-hr)	8.71	6.50	23.48	8.78
SFC,	kg/kW-hr (lb/hp-hr)	0.371	0.610	--	374.
WORK,	kW-hr (hp-hr)	10.49	14.07		

FUEL CONS.

[a] Using a composite value of 10.41 km for the Transient Cycle.
[b] Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.

TABLE F-3 (Cont'd). ENGINE 7 SUMMARY OF RESULTS
1978 Chevrolet 454

TRANSIENT CYCLE MODAL RESULTS [c]

	Cold Cycle				Hot Cycle			
TEST 7-2	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	26.23	22.13	9.16	3.75	7.93	9.52	7.31	4.44
CO, gram	172.87	208.24	285.52	123.57	141.04	167.23	283.93	123.59
CO_2, gram	1121.6	2449.1	5823.3	1162.0	1343.6	2446.7	6323.3	1333.0
NOX, gram	2.65	18.10	64.33	6.01	7.05	17.23	63.23	5.95
FUEL, kg	0.465	0.897	1.986	0.431	0.501	0.864	2.141	0.486
KW-HR	0.50	2.04	6.60	0.72	0.89	2.05	6.62	0.89
TEST 7-3								
HC, gram	43.34	20.89	8.32	4.31	8.21	8.83	7.11	4.39
CO, gram	196.87	206.71	262.31	115.05	149.91	174.30	250.84	120.58
CO_2, gram	1152.7	2513.0	5987.8	1350.2	1224.1	2387.3	5898.5	1350.9
NOX, gram	3.55	17.05	63.15	5.33	5.66	14.40	64.19	5.18
FUEL, kg	0.504	0.916	2.026	0.487	0.468	0.848	1.991	0.490
KW-HR	0.62	2.08	6.68	0.91	0.92	2.11	6.71	0.92

POWER MAPPING (TQ in ft-lb) @ Temp. - 84°F Baro. - 28.89 in Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	318	2100	362	3100	346	4100	
-		1200	326	2200	363	3200	342	4200	
-		1300	334	2300	363	3300	338	4300	
400	284	1400	340	2400	362	3400	333	4400	
500	314	1500	346	2500	361	3500	314	4500	
600	318	1600	350	2600	360	3600	296	4600	
700	316	1700	354	2700	358	3700	240	4700	
800	313	1800	357	2800	356	3800	213	4800	
900	306	1900	360	2900	353	3900	0	4900	
1000	309	2000	361	3000	350	4000		5000	

[c] Barometric Pressure: Test 7-2 = 751 mm Hg Test 7-3 = 749 mm Hg.

TABLE F-4. ENGINE 8 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE

		TEST 8-4			TEST 8-5			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	17.55	3.00	5.08	14.02	3.72	5.19	5.14
CO,	g/kW-hr	127.87	69.58	77.91	119.88	70.27	77.36	77.64
CO_2,	g/kW-hr	1081.	1071.	1072.	1103.	1092.	1094.	1083.
NOX,	g/kW-hr	6.17	7.04	6.92	5.51	6.64	6.48	6.70
SFC,	kg/kW-hr	0.422	0.375	0.382	0.421	0.383	0.388	0.385
WORK,	kW-hr	8.67	8.67	8.67	8.39	8.37	8.37	8.52
POWER,	kW	26.75	26.75	26.75	25.88	25.82	25.83	26.29

NINE MODE

		Test 8-3	Test 8-5	Average
HC,	g/kW-hr	1.754	1.295	1.525
CO,	g/kW-hr	35.758	24.336	20.047
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	4.969	5.705	5.337
SFC,	kg/kW-hr	0.428	0.407	0.418

ENGINE DESCRIPTION

Engine: 1978 IHC 404 CID S/N 404-053483
Rated Power: 189 hp at 3600 rpm
Rated Torque: 323ft-lbs at 2200 rpm
550 rpm

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	5.14	(3.83)	HC	13.35	4.21
CO,	g/kW-hr (g/hp-hr)	77.64	(57.90)	CO	201.66	63.54
NOX,	g/kW-hr (g/hp-hr)	6.70	(5.00)	NOX	17.40	5.48
SFC,	kg/kW-hr (lb/hp-hr)	0.385	(0.633)	FUEL CONS.	--	315.
WORK,	kW-hr (hp-hr)	8.52	(11.43)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE F-4 (Cont'd). ENGINE 8 SUMMARY OF RESULTS
1978 IHC 404

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST 8-4	Speed	Torque	Power	Speed	Torque	Power
Standard Error	74.	13.%	9.%	36.	9.%	7.%
Slope	.981	.784	.923	.992	.882	.952
Corr. Coef.	.9933	.8255	.9532	.9985	.9254	.9701
Intercept	40.	32.0	3.5	17.	18.0	2.7
Points Used	1144.	1139.	1139.	1144.	1144.	1144.
kW-hr Dev.[b]	----------	-0.1	----------	----------	-0.1	----------
TEST 8-5						
Standard Error	41	13.%	9.%	41.	7.%	7.%
Slope	.989	.759	.897	.991	.883	.923
Corr. Coef.	.9980	.8150	.9410	.9980	.9485	.9630
Intercept	21.	29.5	2.9	21.	11.1	2.1
Points Used	1144	1140	1140	1144	1144	1144
kW-hr Dev.[b]	----------	-3.4	----------	----------	-3.8	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
TEST 8-4	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	60.46	58.56	20.27	3.88	7.02	9.01	5.50	4.45
CO, gram	284.25	360.69	392.78	70.89	137.32	158.17	236.59	71.49
CO_2, gram	1097.4	1996.7	5316.1	959.7	1026.5	2004.2	5276.4	978.6
NOX, gram	2.31	7.69	39.92	3.59	3.30	9.51	44.45	3.80
FUEL, kg	0.547	0.867	1.900	0.342	0.399	0.719	1.786	0.348
KW-HR	0.77	1.72	5.43	0.75	0.81	1.69	5.42	0.75
TEST 8-5								
HC, gram	38.85	46.89	27.54	4.36	9.18	10.01	6.60	5.33
CO, gram	226.22	317.74	393.21	68.37	113.89	136.65	258.87	78.72
CO_2, gram	1069.2	2003.1	5220.6	956.2	022.2	1968.3	5281.6	970.0
NOX, gram	1.93	7.29	33.57	3.40	2.73	8.83	40.78	3.20
FUEL, kg	0.488	0.836	1.868	0.340	0.356	0.698	1.800	0.350
KW-HR	0.69	1.68	5.28	0.74	0.72	1.64	5.28	0.73

Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
Barometric Pressure: Test 8.4 = 748 mm Hg Test 8.5 = 742 mm Hg.

TABLE F-4 (Cont'd). ENGINE 8 SUMMARY OF RESULTS
1978 IHC 404

ENGINE DESCRIPTION

Engine: 1978 International Harvester 404 CID S/N 404-05483

	Mfg. Spec.	Measured
Max. Engine Torque, Ft-Lb @ RPM	323 @ 2200	300 @ 2200
Max. Engine Power, HP @ RPM	189 @ 3600	171 @ 3600
Idle RPM	525 - 575	550

POWER MAPPING (TQ in ft-lb) @ Temp. - 68 °F Baro. - 29.13" Hg

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	272	2100	300	3100	279	4100	
-		1200	276	2200	300	3200	274	4200	
-		1300	280	2300	300	3300	268	4300	
400	208	1400	284	2400	300	3400	263	4400	
500	251	1500	288	2500	298	3500	256	4500	
600	260	1600	291	2600	296	3600	250	4600	
700	262	1700	294	2700	294	3700	243	4700	
800	258	1800	296	2800	291	3800	236	4800	
900	262	1900	298	2900	288	3900	229	4900	
1000	270	2000	299	3000	284	4000	221	5000	

TABLE F-5. ENGINE 10 SUMMARY OF RESULTS
1979 GMC 292

TRANSIENT CYCLE

		TEST 10-1			TEST 10-2			
		Cold	Hot	Composite	Cold	Hot	Composite	Average
HC,	g/kW-hr	11.63	11.30	11.35	16.85	13.25	13.76	12.56
CO,	g/kW-hr	130.96	121.36	122.73	133.32	120.03	121.93	122.33
CO_2,	g/kW-hr	980.	994.	922.	988.	970.	973.	983.
NOX,	g/kW-hr	19.20	18.86	18.91	15.90	16.72	16.60	17.76
SFC,	kg/kW-hr	0.385	0.385	0.385	0.394	0.379	0.381	0.383
WORK,	kW-hr	6.13	6.21	6.20	6.27	6.30	6.30	6.25
POWER,	kW	18.91	19.16	19.12	19.34	19.44	19.43	19.28

NINE MODE

		Test 10-4	Test 10-5	Average
HC,	g/kW-hr	5.059	5.788	5.424
CO,	g/kW-hr	62.601	72.006	67.304
CO_2,	g/kW-hr	--	--	--
NOX,	g/kW-hr	16.699	18.760	17.730
SFC,	kg/kW-hr	0.421	0.426	0.424

TRANSIENT CYCLE AVERAGE VALUES

					g/kg Fuel	g/km[a]
HC,	g/kW-hr (g/hp-hr)	12.56	(9.37)	HC	32.79	7.54
CO,	g/kW-hr (g/hp-hr)	122.33	(91.22)	CO	164.05	73.45
NOX,	g/kW-hr (g/hp-hr)	17.76	(13.24)	NOX	46.37	10.66
SFC,	kg/kW-hr (lb/hp-hr)	0.383	(0.630)	FUEL CONS.	--	230.
WORK,	kW-hr (hp-hr)	6.25	(8.38)			

[a] Using a composite value of 10.41 km for the Transient Cycle.

TABLE F-5 (Cont'd). ENGINE 10 SUMMARY OF RESULTS
1978 GMC 292

TRANSIENT CYCLE STATISTICS

	Cold Cycle			Hot Cycle		
TEST	Speed	Torque	Power	Speed	Torque	Power
Standard Error	42.	9.%	6.%	35.	8.%	6.%
Slope	1.002	.929	.990	1.001	.930	.991
Corr. Coef.	.9976	.9262	.9825	.9983	.9316	.9835
Intercept	13.	8.4	.9	20.	9.6	1.4
Points Used	1144	1114	1114	1144	1109	1109
kW-hr Dev.[b]	----------	1.9	----------	----------	3.1	----------
TEST						
Standard Error	42.	8.%	6.%	50.	9.%	7.%
Slope	.999	.946	1.000	.998	.942	1.003
Corr. Coef.	.9975	.9379	.9851	.9965	.9317	.9803
Intercept	13.	9.0	1.1	23.	9.3	1.2
Points Used	1144	1128	1128	1144	1136	1136
kW-hr Dev.[b]	----------	4.2	----------	----------	4.7	----------

TRANSIENT CYCLE MODAL RESULTS[c]

	Cold Cycle				Hot Cycle			
Test	NYNF	LANF	LAF	NYNF	NYNF	LANF	LAF	NYNF
HC, gram	43.85	12.37	7.99	7.06	45.93	9.76	7.49	6.95
CO, gram	296.80	143.61	309.18	52.86	262.73	123.83	309.86	56.81
CO_2, gram	619.4	1291.4	3446.0	646.3	639.7	1332.3	3564.1	634.8
NOX, gram	3.90	22.44	81.77	9.53	3.42	22.32	82.26	9.09
FUEL, kg	0.386	0.491	1.247	0.237	0.378	0.491	1.285	0.235
KW-HR	0.64	1.23	3.74	0.52	0.68	1.23	3.76	0.54
TEST								
HC, gram	68.91	16.54	10.22	10.00	49.22	14.17	10.42	9.69
CO, gram	347.05	140.38	293.60	55.02	283.41	126.16	290.34	56.36
CO_2 gram	655.1	1326.3	3565.2	650.6	647.1	1298.0	3530.6	639.2
NOX, gram	3.51	18.14	70.36	7.69	2.88	19.26	75.23	7.98
FUEL, kg	0.447	0.504	1.280	0.242	0.394	0.486	1.267	0.239
KW-HR	0.71	1.24	3.78	0.54	0.72	1.24	3.80	0.54

[b]Test kW-hr minus Reference kW-hr divided by the Reference kW-hr times 100%.
[c]Barometric Pressure: Test 10-1 = 741 mm Hg Test 10-2 = 741 mm Hg.

TABLE F-5 (Cont'd). ENGINE 10 SUMMARY OF RESULTS
1978 GMC 292

ENGINE DESCRIPTION

Engine: 1979 General Motors 292 CID

	Mfg. Specs.	Measured
Max. Engine Torque, Ft-Lb @ RPM	215 @ 1600	220 @ 1400
Max. Engine Power, HP @ RPM	115 @ 3400	108 @ 3600
Idle RPM	700	700

POWER MAPPING (TQ in ft-lb) @ Temp. - 70 Baro. - 29.15

RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ	RPM	TQ
-		1100	217	2100	208	3100	177	4100	
-		1200	219	2200	205	3200	173	4200	
-		1300	220	2300	202	3300	169	4300	
400		1400	220	2400	199	3400	165	4400	
500	164	1500	220	2500	196	3500	161	4500	
600	189	1600	219	2600	193	3600	157	4600	
700	198	1700	217	2700	190	3700	152	4700	
800	205	1800	215	2800	187	3800	146	4800	
900	210	1900	213	2900	183	3900	140	4900	
1000	214	2000	211	3000	180	4000	0	5000	

TABLE F-6A. TEST 1-8 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 1-8 RUN
DATE 9/11/78
TIME 10:11
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.58 MM HG(28.96 IN HG)
DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)

RELATIVE HUMIDITY 84 PCT
ABSOLUTE HUMIDITY 19.1 GM/KG(133.9 GRAINS/LB)

NOX HUMIDITY C.F. 1.3825

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	55.0 (131.0)	56.7 (134.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8088	8317	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	176.9 (6250)	198.9 (7024)	201.7 (7124)	176.6 (6238)
HC SAMPLE METER/RANGE/PPM	37.4/ 3/ 374	19.7/ 3/ 197	83.3/ 2/ 83	43.0/ 2/ 43
HC BCKGRD METER/RANGE/PPM	.7/ 3/ 7	1.3/ 3/ 13	10.9/ 2/ 11	9.1/ 2/ 9
CO SAMPLE METER/RANGE/PPM	62.0/ 3/ 1826	46.1/ 3/ 1358	54.1/ 3/ 1593	19.1/ 3/ 569
CO BCKGRD METER/RANGE/PPM	.1/ 3/ 3	.1/ 3/ 3	.7/ 3/ 21	.7/ 3/ 21
CO2 SAMPLE METER/RANGE/PCT	25.3/ 3/ .91	38.2/ 3/ .64	84.5/ 3/ 1.56	22.4/ 3/ .36
CO2 BCKGRD METER/RANGE/PCT	2.7/ 3/ .09	2.4/ 3/ .09	2.1/ 3/ .03	2.3/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	8.6/ 2/ 9	17.9/ 2/ 18	88.3/ 2/ 88	10.6/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.6/ 2/ 1	1.1/ 2/ 1
DILUTION FACTOR	21.34	16.87	7.80	31.65
HC CONCENTRATION PPM	367	185	74	34
CO CONCENTRATION PPM	1759	1301	1484	529
CO2 CONCENTRATION PCT	.38	.61	1.53	.33
NOX CONCENTRATION PPM	8.5	17.8	87.8	9.5
HC MASS GRAMS	37.49	21.19	8.58	3.48
CO MASS GRAMS	362.42	301.38	348.54	108.81
CO2 MASS GRAMS	1215.3	2221.0	5656.7	1067.9
FUEL KG (LB)	3.98	4.37	46.82	4.45
KW HR (HP HR)	.600 (1.32)	.871 (1.92)	1.964 (4.33)	.394 (.87)
	.91 (1.22)	1.77 (2.37)	5.35 (7.18)	.79 (1.06)
BSHC G/KW HR (G/HP HR)	41.26 (30.77)	12.00 (8.95)	1.60 (1.20)	4.39 (3.27)
BSCO G/KW HR (G/HP HR)	398.88 (297.44)	170.58 (127.20)	65.14 (48.57)	137.05 (102.20)
BSCO2 G/KW HR (G/HP HR)	1337.52 (997.39)	1257.14 (937.45)	1057.20 (788.35)	1345.13 (1003.07)
BSNOX G/KW HR (G/HP HR)	4.38 (3.27)	5.30 (3.95)	8.75 (6.53)	5.61 (4.18)
BSFC KG/KW HR (LB/HP HR)	.661 (1.086)	.493 (.810)	.367 (.604)	.496 (.816)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.82 (	11.83)
BSHC G/KW HR (G/HP HR)	8.02 (	5.98)
BSCO G/KW HR (G/HP HR)	127.12 (	94.79)
BSCO2 G/KW HR (G/HP HR)	1152 (	859)
BSNOX G/KW HR (G/HP HR)	7.33 (	5.46)
BSFC KG/KW HR (LB/HP HR)	.434 (	.714)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-6A (CONT'D). TEST 1-8 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 1-8 RUN
DATE 9/11/78
TIME 10:52
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 735.58 MM HG(28.96 IN HG)
DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)

RELATIVE HUMIDITY 78 PCT
ABSOLUTE HUMIDITY 18.4 GM/KG(129.1 GRAINS/LB)

NOX HUMIDITY C.F. 1.3408

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	55.0 (131.0)	56.7 (134.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8087	8314	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	176.9 (6248)	198.8 (7023)	201.6 (7121)	176.6 (6237)
HC SAMPLE METER/RANGE/PPM	85.5/ 2/ 85	83.1/ 2/ 83	76.9/ 2/ 77	50.0/ 2/ 50
HC BCKGRD METER/RANGE/PPM	9.9/ 2/ 10	10.4/ 2/ 10	8.7/ 2/ 9	7.6/ 2/ 8
CO SAMPLE METER/RANGE/PPM	19.4/ 3/ 577	30.3/ 3/ 895	55.0/ 3/ 1620	18.9/ 3/ 563
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 28	.9/ 3/ 28	.8/ 3/ 24	.9/ 3/ 28
CO2 SAMPLE METER/RANGE/PCT	22.2/ 3/ .36	36.1/ 3/ .61	84.0/ 3/ 1.55	22.6/ 3/ .37
CO2 BCKGRD METER/RANGE/PCT	2.1/ 3/ .03	2.2/ 3/ .03	2.2/ 3/ .03	2.0/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	10.9/ 2/ 11	20.3/ 2/ 20	90.0/ 2/ 90	11.3/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	31.52	19.12	7.84	31.38
HC CONCENTRATION PPM	76	73	69	93
CO CONCENTRATION PPM	533	837	1510	519
CO2 CONCENTRATION PCT	.33	.57	1.52	.34
NOX CONCENTRATION PPM	10.3	19.7	89.3	10.5
HC MASS GRAMS	7.75	8.40	8.06	4.34
CO MASS GRAMS	109.75	193.80	354.41	106.63
CO2 MASS GRAMS	1068.1	2091.7	5608.8	1093.3
NOX MASS GRAMS	4.68	10.06	46.18	4.77
FUEL KG (LB)	.399 (.88)	.764 (1.68)	1.952 (4.30)	.402 (.89)
KW HR (HP HR)	.79 (1.06)	1.71 (2.29)	5.30 (7.11)	.79 (1.06)
BSHC G/KW HR (G/HP HR)	9.81 (7.32)	4.92 (3.67)	1.52 (1.13)	5.47 (4.08)
BSCO G/KW HR (G/HP HR)	139.04 (103.68)	113.53 (84.66)	66.81 (49.82)	134.32 (100.16)
BSCO2 G/KW HR (G/HP HR)	1353.18 (1009.07)	1225.30 (913.71)	1057.31 (788.44)	1377.20 (1026.98)
BSNOX G/KW HR (G/HP HR)	5.93 (4.42)	5.90 (4.40)	8.70 (6.49)	6.01 (4.48)
BSFC KG/KW HR (LB/HP HR)	.505 (.831)	.447 (.736)	.368 (.605)	.506 (.832)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.60	(11.53)
BSHC G/KW HR (G/HP HR)	3.32	(2.48)
BSCO G/KW HR (G/HP HR)	88.96	(66.34)
BSCO2 G/KW HR (G/HP HR)	1147	(856)
BSNOX G/KW HR (G/HP HR)	7.64	(5.70)
BSFC KG/KW HR (LB/HP HR)	.409	(.673)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00	(0.0)

TABLE F-6B. .TEST 1-9 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.IN404
ENGINE MODEL 79
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 1-9 RUN
DATE 9/12/78
TIME 0210
DYNO NO. 2
GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 734.06 MM HG(28.90 IN HG)
DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)

RELATIVE HUMIDITY 81 PCT
ABSOLUTE HUMIDITY 14.3 GM/KG(134.8 GRAINS/LB)
NOX HUMIDITY C.F. 1.3911

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	55.0 (131.0)	55.6 (132.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8088	8316	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	176.5 (6236)	198.4 (7009)	201.8 (7129)	176.2 (6223)
HC SAMPLE METER/RANGE/PPM	36.4/ 3/ 364	19.4/ 3/ 194	86.1/ 2/ 86	48.0/ 2/ 48
HC BCKGRD METER/RANGE/PPM	.8/ 3/ 8	1.4/ 3/ 14	11.4/ 2/ 12	9.5/ 2/ 10
CO SAMPLE METER/RANGE/PPM	59.4/ 3/ 1764	44.2/ 3/ 1302	59.8/ 3/ 1761	20.0/ 3/ 595
CO BCKGRD METER/RANGE/PPM	.2/ 3/ 6	.1/ 3/ 3	.4/ 3/ 28	.8/ 3/ 24
CO2 SAMPLE METER/RANGE/PCT	25.2/ 3/ .41	38.4/ 3/ .66	84.7/ 3/ 1.56	23.4/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	.1/ 3/ .00	3.1/ 3/ .05	3.2/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	8.1/ 2/ 8	19.0/ 2/ 19	83.3/ 2/ 83	9.4/ 2/ 10
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.7/ 2/ 1	.7/ 2/ 1
DILUTION FACTOR	21.63	16.72	7.71	30.20
HC CONCENTRATION PPM	356	181	76	39
CO CONCENTRATION PPM	1698	1248	1638	552
CO2 CONCENTRATION PCT	.37	.66	1.52	.33
NOX CONCENTRATION PPM	7.9	18.7	82.7	9.2
HC MASS GRAMS	36.29	20.70	8.82	3.94
CO MASS GRAMS	399.06	288.47	385.06	113.23
CO2 MASS GRAMS	1183.0	2382.6	5627.8	1077.8
NOX MASS GRAMS	3.72	9.88	44.41	4.32
FUEL KG (LB)	.582 (1.28)	.915 (2.02)	1.974 (4.35)	.400 (.88)
KW HR (HP HR)	.90 (1.21)	1.75 (2.35)	5.30 (7.11)	.78 (1.05)
BSHC G/KW HR (G/HP HR)	40.35 (30.09)	11.81 (8.80)	1.66 (1.24)	5.03 (3.75)
BSCO G/KW HR (G/HP HR)	388.09 (289.48)	164.56 (122.71)	72.65 (54.18)	144.29 (107.60)
BSCO2 G/KW HR (G/HP HR)	1315.30 (980.92)	1359.17 (1013.53)	1061.90 (791.78)	1373.52 (1024.29)
BSNOX G/KW HR (G/HP HR)	4.13 (3.08)	5.64 (4.20)	8.38 (6.25)	5.51 (4.11)
BSFC KG/KW HR (LB/HP HR)	.647 (1.064)	.522 (.858)	.372 (.612)	.509 (.838)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.24	(11.72)
BSHC G/KW HR (G/HP HR)	7.48	(5.95)
BSCO G/KW HR (G/HP HR)	130.00	(96.94)
BSCO2 G/KW HR (G/HP HR)	1176	(877)
BSNOX G/KW HR (G/HP HR)	7.13	(5.32)
BSFC KG/KW HR (LB/HP HR)	.993	(.728)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-6B (CONT'D). TEST 1-9 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IN404
ENGINE MODEL 79
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 1-9 RUN
DATE 9/12/78
TIME 02141
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 739.86 MM HG(29.90 IN HG)
DRY BULB TEMP. 28.3 DEG C(83.0 DEG F)

RELATIVE HUMIDITY 75 PCT
ABSOLUTE HUMIDITY 18.8 GM/KG(131.7 GRAINS/LB) NOX HUMIDITY C.F. 1.3636

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	55.0 (131.0)	57.2 (135.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7168	8087	8316	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	176.5 (6235)	198.4 (7008)	200.9 (7096)	176.2 (6222)
HC SAMPLE METER/RANGE/PPM	76.3/ 2/ 76	82.7/ 2/ 83	76.4/ 2/ 76	98.8/ 2/ 99
HC BCKGRD METER/RANGE/PPM	9.1/ 2/ 9	8.1/ 2/ 8	7.1/ 2/ 7	7.4/ 2/ 8
CO SAMPLE METER/RANGE/PPM	20.1/ 3/ 598	30.4/ 3/ 898	55.3/ 3/ 1628	20.6/ 3/ 612
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.8/ 3/ 24	.9/ 3/ 28	.8/ 3/ 24
CO2 SAMPLE METER/RANGE/PCT	23.3/ 3/ .38	37.3/ 3/ .63	89.0/ 3/ 1.55	23.9/ 3/ .39
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	3.5/ 3/ .05	3.3/ 3/ .05	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.6/ 2/ 11	20.1/ 2/ 20	89.5/ 2/ 89	10.2/ 2/ 10
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.6/ 2/ 1	.6/ 2/ 1	.8/ 2/ 1
DILUTION FACTOR	30.10	18.54	7.84	29.50
HC CONCENTRATION PPM	68	75	70	91
CO CONCENTRATION PPM	559	843	1517	570
CO2 CONCENTRATION PCT	.33	.58	1.50	.34
NOX CONCENTRATION PPM	10.0	14.5	89.0	9.9
HC MASS GRAMS	6.87	9.59	8.13	9.18
CO MASS GRAMS	114.82	194.82	359.99	116.94
CO2 MASS GRAMS	1059.7	2097.2	5539.5	1096.0
NOX MASS GRAMS	9.61	10.11	96.63	9.33
FUEL KG (LB)	.398 (.88)	.766 (1.69)	1.929 (4.25)	.408 (.90)
KW HR (HP HR)	.77 (1.03)	1.70 (2.28)	5.30 (7.11)	.78 (1.05)
BSHC G/Kw HR (G/HP HR)	8.91 (6.65)	5.06 (3.77)	1.53 (1.14)	5.36 (4.00)
BSCO G/Kw HR (G/HP HR)	149.01 (111.11)	114.74 (85.56)	66.91 (49.89)	149.90 (111.78)
BSCO2 G/Kw HR (G/HP HR)	1379.55 (1025.00)	1235.15 (921.05)	1043.30 (777.99)	1909.95 (1097.67)
BSNOX G/Kw HR (G/HP HR)	5.98 (4.46)	5.95 (4.44)	8.79 (6.55)	5.55 (4.14)
BSFC KG/Kw HR (LB/HP HR)	.516 (.848)	.451 (.742)	.369 (.598)	.523 (.859)

TOTAL TEST RESULTS 4 BAGS

TOTAL Kw HR (HP HR)	8.55 (11.47)
BSHC G/Kw HR (G/HP HR)	3.25 (2.42)
BSCO G/Kw HR (G/HP HR)	91.37 (68.14)
BSCO2 G/Kw HR (G/HP HR)	1144 (853)
BSNOX G/Kw HR (G/HP HR)	7.68 (5.73)
BSFC KG/Kw HR (LB/HP HR)	.409 (.673)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/Kw HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-7A. TEST 6-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 4

TEST NO. 6-3 RUN
DATE 1/ 4/79
TIME 09140
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 753.11 MM HG(29.65 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 20 PCT
ABSOLUTE HUMIDITY 4.0 GM/KG(27.8 GRAINS/LB)

NOX HUMIDITY C.F. .8184

BAG RESULTS

	1 NYNF	2 LANF	3 LAF	4 NYNF
BAG NUMBER				
DESCRIPTION				
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8089	8317	7191
TIME SECONDS	272.0	307.0	316.0	273.0
TOTAL FLOW STD. CU. METRES(SCF)	185.3 (6544)	208.7 (7371)	212.9 (7521)	185.7 (6558)
HC SAMPLE METER/RANGE/PPM	25.7/ 3/ 257	24.2/ 3/ 242	12.6/ 3/ 126	85.3/ 2/ 85
HC BCKGRD METER/RANGE/PPM	1.7/ 3/ 17	1.5/ 3/ 15	1.5/ 3/ 15	12.8/ 2/ 13
CO SAMPLE METER/RANGE/PPM	39.4/ 3/ 1161	45.3/ 3/ 1339	73.6/ 3/ 2165	17.1/ 3/ 510
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.6/ 3/ 18	.8/ 3/ 24	.6/ 3/ 18
CO2 SAMPLE METER/RANGE/PCT	29.4/ 3/ .90	35.3/ 3/ .59	79.5/ 3/ 1.95	21.4/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.3/ 3/ .05	3.3/ 3/ .05	3.5/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.2/ 2/ 10	33.7/ 2/ 34	47.5/ 3/ 142	20.0/ 2/ 20
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.1/ 3/ 0	.5/ 2/ 1
DILUTION FACTOR	24.86	17.94	8.01	33.02
HC CONCENTRATION PPM	241	228	113	73
CO CONCENTRATION PPM	1124	1293	2069	486
CO2 CONCENTRATION PCT	.35	.59	1.41	.29
NOX CONCENTRATION PPM	9.7	33.2	142.2	14.5
HC MASS GRAMS	25.72	27.42	13.86	7.81
CO MASS GRAMS	242.57	314.24	513.06	104.99
CO2 MASS GRAMS	1183.1	2079.0	5485.2	1002.8
NOX MASS GRAMS	2.82	10.86	47.42	5.67
FUEL KG (LB)	.519 (1.14)	.838 (1.85)	1.997 (4.40)	.376 (.83)
KW HR (HP HR)	.82 (1.09)	1.78 (2.39)	5.77 (7.74)	.75 (1.00)
BSHC G/KW HR (G/HP HR)	31.51 (23.50)	15.41 (11.49)	2.40 (1.79)	10.45 (7.79)
BSCO G/KW HR (G/HP HR)	297.18 (221.61)	176.53 (131.64)	88.93 (66.32)	140.53 (104.79)
BSCO2 G/KW HR (G/HP HR)	1449.97 (1080.82)	1167.94 (870.93)	950.78 (709.00)	1342.34 (1000.99)
BSNOX G/KW HR (G/HP HR)	3.45 (2.58)	6.10 (4.55)	8.22 (6.13)	7.59 (5.66)
BSFC KG/KW HR (LB/HP HR)	.636 (1.045)	.471 (.774)	.346 (.569)	.503 (.827)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.11	(12.22)
BSHC G/KW HR (G/HP HR)	8.21	(6.12)
BSCO G/KW HR (G/HP HR)	128.93	(96.14)
BSCO2 G/KW HR (G/HP HR)	1070	(798)
BSNOX G/KW HR (G/HP HR)	7.33	(5.46)
BSFC KG/KW HR (LB/HP HR)	.409	(.673)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE F-7A (CONT'D). TEST 6-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

BAROMETER 753.11 MM HG(29.65 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

TEST NO. 6-3 RUN
DATE 1/ 9/79
TIME 09140
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

RELATIVE HUMIDITY 23 PCT
ABSOLUTE HUMIDITY 9.7 GM/KG(33.0 GRAINS/LB)

NOX HUMIDITY C.F. .8353

BAG RESULTS	1	2	3	4
BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7166	8086	8315	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	185.2 (6541)	208.6 (7368)	212.9 (7519)	185.0 (6533)
HC SAMPLE METER/RANGE/PPM	12.4/ 3/ 124	14.3/ 3/ 143	87.2/ 2/ 87	82.5/ 2/ 83
HC BCKGRD METER/RANGE/PPM	1.2/ 3/ 12	1.4/ 3/ 14	9.9/ 2/ 10	10.1/ 2/ 10
CO SAMPLE METER/RANGE/PPM	23.1/ 3/ 685	31.7/ 3/ 936	58.3/ 3/ 1717	17.4/ 3/ 519
CO BCKGRD METER/RANGE/PPM	1.0/ 3/ 31	.8/ 3/ 24	.7/ 3/ 21	1.4/ 3/ 43
CO2 SAMPLE METER/RANGE/PCT	20.9/ 3/ .34	34.3/ 3/ .57	80.0/ 3/ 1.46	21.8/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.5/ 3/ .05	3.6/ 3/ .06	3.6/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	15.3/ 2/ 15	36.3/ 2/ 36	51.0/ 3/ 153	19.6/ 2/ 20
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.4/ 3/ 1	.6/ 2/ 1
DILUTION FACTOR	32.03	19.71	8.19	32.43
HC CONCENTRATION PPM	112	130	79	73
CO CONCENTRATION PPM	646	896	1637	470
CO2 CONCENTRATION PCT	.29	.52	1.41	.30
NOX CONCENTRATION PPM	14.8	35.8	151.9	14.0
HC MASS GRAMS	12.00	15.61	9.64	7.76
CO MASS GRAMS	139.41	217.62	405.83	101.29
CO2 MASS GRAMS	976.5	1997.2	5509.1	1017.3
NOX MASS GRAMS	4.38	11.94	51.68	5.62
FUEL KG (LB)	.389 (.86)	.753 (1.66)	1.947 (4.29)	.379 (.83)
KW HR (HP HR)	.72 (.96)	1.72 (2.31)	5.78 (7.76)	.73 (.98)
BSHC G/KW HR (G/HP HR)	16.68 (12.44)	9.05 (6.75)	1.67 (1.24)	10.58 (7.89)
BSCO G/KW HR (G/HP HR)	193.78 (144.50)	126.18 (94.09)	70.18 (52.33)	138.14 (103.01)
BSCO2 G/KW HR (G/HP HR)	1357.36 (1012.18)	1157.98 (863.51)	952.64 (710.38)	1327.92 (1039.60)
BSNOX G/KW HR (G/HP HR)	6.09 (4.54)	6.92 (5.16)	8.94 (6.66)	7.67 (5.72)
BSFC KG/KW HR (LB/HP HR)	.541 (.889)	.437 (.718)	.337 (.554)	.516 (.849)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.96	(12.02)
BSHC G/KW HR (G/HP HR)	5.02	(3.75)
BSCO G/KW HR (G/HP HR)	96.44	(71.92)
BSCO2 G/KW HR (G/HP HR)	1060	(791)
BSNOX G/KW HR (G/HP HR)	8.22	(6.13)
BSFC KG/KW HR (LB/HP HR)	.387	(.636)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE F-7B. TEST 6-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 6-4 RUN
DATE 1/ 5/79
TIME 09:40
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 749.30 MM HG(29.50 IN HG)
DRY BULB TEMP. 28.3 DEG C(83.0 DEG F)

RELATIVE HUMIDITY 27 PCT
ABSOLUTE HUMIDITY 6.5 GM/KG(45.8 GRAINS/LB)

NOX HUMIDITY C.F. .8794

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8091	8316	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.3 (6509)	207.6 (7333)	211.8 (7480)	184.0 (6498)
HC SAMPLE METER/RANGE/PPM	21.7/ 3/ 217	32.5/ 3/ 325	17.6/ 3/ 176	9.9/ 3/ 99
HC BCKGRD METER/RANGE/PPM	.8/ 3/ 8	1.1/ 3/ 11	1.4/ 3/ 14	1.3/ 3/ 13
CO SAMPLE METER/RANGE/PPM	37.9/ 3/ 1117	59.8/ 3/ 1761	79.0/ 3/ 2320	17.1/ 3/ 510
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 15	.7/ 3/ 21	1.1/ 3/ 34	1.1/ 3/ 34
CO2 SAMPLE METER/RANGE/PCT	29.2/ 3/ .90	36.6/ 3/ .62	80.1/ 3/ 1.96	20.7/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.2/ 3/ .05	3.1/ 3/ .05	3.0/ 3/ .05	2.9/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.9/ 2/ 9	32.1/ 2/ 32	41.8/ 3/ 125	18.8/ 2/ 19
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.3/ 3/ 1	.7/ 2/ 1
DILUTION FACTOR	25.43	16.39	7.86	33.91
HC CONCENTRATION PPM	209	315	169	86
CO CONCENTRATION PPM	1085	1705	2206	470
CO2 CONCENTRATION PCT	.35	.57	1.42	.29
NOX CONCENTRATION PPM	8.9	31.6	124.6	18.1
HC MASS GRAMS	22.25	37.68	20.00	9.17
CO MASS GRAMS	232.73	412.18	543.90	100.68
CO2 MASS GRAMS	1175.0	2169.9	5521.0	983.6
NOX MASS GRAMS	2.76	11.05	44.39	5.61
FUEL KG (LB)	.508 (1.12)	.926 (2.04)	2.030 (4.48)	.369 (.81)
KW HR (HP HR)	.73 (.98)	1.79 (2.41)	5.57 (7.47)	.71 (.95)
BSHC G/KW HR (G/HP HR)	30.34 (22.63)	21.01 (15.66)	3.59 (2.68)	12.91 (9.62)
BSCO G/KW HR (G/HP HR)	317.40 (236.68)	229.74 (171.33)	97.63 (72.80)	141.76 (105.71)
BSCO2 G/KW HR (G/HP HR)	1602.48 (1194.97)	1209.59 (901.99)	991.06 (739.03)	1385.03 (1032.81)
BSNOX G/KW HR (G/HP HR)	3.77 (2.81)	6.16 (4.59)	7.97 (5.94)	7.90 (5.89)
BSFC KG/KW HR (LB/HP HR)	.693 (1.139)	.516 (.849)	.364 (.599)	.520 (.854)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.81 (11.81)
BSHC G/KW HR (G/HP HR)	10.12 (7.54)
BSCO G/KW HR (G/HP HR)	146.90 (109.17)
BSCO2 G/KW HR (G/HP HR)	1118 (834)
BSNOX G/KW HR (G/HP HR)	7.24 (5.40)
BSFC KG/KW HR (LB/HP HR)	.435 (.715)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-7B (CONT'D). TEST 6-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

TEST NO. 6-4 RUN
DATE 1/ 5/79
TIME 09:40
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

RELATIVE HUMIDITY 30 PCT
ABSOLUTE HUMIDITY 6.5 GM/KG(45.6 GRAINS/LB) NOX HUMIDITY C.F. .8785

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

BAROMETER 749.30 MM HG(29.50 IN HG)
DRY BULB TEMP. 26.7 DEG C(80.0 DEG F)

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7164	8084	8312	7160
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.1 (6504)	207.4 (7327)	211.7 (7476)	183.9 (6494)
HC SAMPLE METER/RANGE/PPM	14.1/ 3/ 141	15.0/ 3/ 150	10.3/ 3/ 103	84.6/ 2/ 85
HC BCKGRD METER/RANGE/PPM	1.2/ 3/ 12	1.1/ 3/ 11	.9/ 3/ 9	7.2/ 2/ 7
CO SAMPLE METER/RANGE/PPM	24.3/ 3/ 720	31.5/ 3/ 930	55.3/ 3/ 1628	17.8/ 3/ 530
CO BCKGRD METER/RANGE/PPM	.9/ 3/ 28	1.0/ 3/ 31	1.3/ 3/ 40	1.2/ 3/ 37
CO2 SAMPLE METER/RANGE/PCT	20.2/ 3/ .33	34.1/ 3/ .57	79.0/ 3/ 1.44	21.7/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	2.9/ 3/ .04	2.9/ 3/ .04	2.8/ 3/ .04	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.7/ 2/ 14	37.6/ 2/ 38	51.7/ 3/ 155	20.2/ 2/ 20
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.5/ 2/ 1	.2/ 3/ 1	.5/ 2/ 1
DILUTION FACTOR	32.57	19.81	8.34	32.46
HC CONCENTRATION PPM	129	140	95	78
CO CONCENTRATION PPM	683	883	1533	487
CO2 CONCENTRATION PCT	.28	.53	1.40	.31
NOX CONCENTRATION PPM	13.1	37.1	154.6	19.7
HC MASS GRAMS	13.74	16.70	11.61	8.23
CO MASS GRAMS	146.38	213.19	377.88	104.20
CO2 MASS GRAMS	955.9	2005.9	5436.5	1046.0
NOX MASS GRAMS	4.06	12.94	54.98	6.09
FUEL KG (LB)	.388 (.85)	.755 (1.66)	1.913 (4.22)	.390 (.86)
KW HR (HP HR)	.69 (.93)	1.66 (2.22)	5.54 (7.43)	.71 (.96)
BSHC G/KW HR (G/HP HR)	19.86 (14.81)	10.09 (7.52)	2.09 (1.56)	11.52 (8.59)
BSCO G/KW HR (G/HP HR)	211.61 (157.79)	128.77 (96.03)	68.17 (50.84)	145.78 (108.71)
BSCO2 G/KW HR (G/HP HR)	1381.91 (1030.49)	1211.60 (903.49)	980.75 (731.35)	1463.33 (1091.21)
BSNOX G/KW HR (G/HP HR)	5.87 (4.38)	7.82 (5.83)	9.92 (7.40)	8.52 (6.36)
BSFC KG/KW HR (LB/HP HR)	.560 (.921)	.456 (.749)	.345 (.567)	.545 (.896)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)		8.61 (11.54)
BSHC	G/KW HR (G/HP HR)	5.84 (4.36)
BSCO	G/KW HR (G/HP HR)	97.81 (72.93)
BSCO2	G/KW HR (G/HP HR)	1097 (818)
BSNOX	G/KW HR (G/HP HR)	9.07 (6.77)
BSFC	KG/KW HR (LB/HP HR)	.400 (.658)

TABLE F 8A. TEST 7-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH454
ENGINE MODEL 79 CHEV 454
ENGINE 7.4 L(454 CID) V-8
CVS NO. 9

TEST NO. 7-2 RUN
DATE 1/31/79
TIME 08:46 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 751.08 MM HG(29.57 IN HG)
DRY BULB TEMP. 27.8 DEG C(82.0 DEG F)

RELATIVE HUMIDITY 15 PCT
ABSOLUTE HUMIDITY 3.5 GM/KG(24.8 GRAINS/LB) — NOX HUMIDITY C.F. .8091

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7143	8089	8314	7164
TIME SECONDS	271.1	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.1 (6501)	208.1 (7350)	212.4 (7501)	184.4 (6514)
HC SAMPLE METER/RANGE/PPM	25.0/ 3/ 250	19.0/ 3/ 190	8.0/ 3/ 80	4.2/ 3/ 42
HC BCKGRD METER/RANGE/PPM	.3/ 3/ 3	.6/ 3/ 6	.6/ 3/ 6	.7/ 3/ 7
CO SAMPLE METER/RANGE/PPM	28.2/ 3/ 834	31.0/ 3/ 916	41.6/ 3/ 1226	21.1/ 3/ 627
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	1.4/ 3/ 43	1.1/ 3/ 34	1.5/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	22.8/ 3/ .37	40.0/ 3/ .68	82.7/ 3/ 1.52	23.2/ 3/ .38
CO2 BCKGRD METER/RANGE/PCT	2.6/ 3/ .04	2.4/ 3/ .04	1.7/ 3/ .03	2.3/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.4/ 2/ 9	56.3/ 2/ 56	65.5/ 3/ 196	7.4/ 3/ 22
NOX BCKGRD METER/RANGE/PPM	.1/ 2/ 0	.1/ 2/ 0	.3/ 3/ 1	.4/ 3/ 1
DILUTION FACTOR	28.01	17.05	8.14	30.17
HC CONCENTRATION PPM	247	184	75	35
CO CONCENTRATION PPM	806	859	1154	575
CO2 CONCENTRATION PCT	.33	.64	1.50	.34
NOX CONCENTRATION PPM	9.3	56.2	195.7	21.0
HC MASS GRAMS	26.23	22.13	9.16	3.75
CO MASS GRAMS	172.87	208.24	285.52	123.57
CO2 MASS GRAMS	1121.6	2449.1	5823.3	1162.0
NOX MASS GRAMS	2.65	18.10	64.33	6.01
FUEL KG (LB)	.465 (1.03)	.897 (1.98)	1.986 (4.38)	.431 (.95)
KW HR (HP HR)	.50 (.67)	2.04 (2.73)	6.60 (8.85)	.72 (.97)
BSHC G/KW HR (G/HP HR)	52.16 (38.90)	10.85 (8.09)	1.39 (1.03)	5.19 (3.87)
BSCO G/KW HR (G/HP HR)	343.73 (256.32)	102.12 (76.15)	43.28 (32.27)	171.06 (127.56)
BSCO2 G/KW HR (G/HP HR)	2230.21 (1663.06)	1201.03 (895.61)	882.65 (658.20)	1608.52 (1199.47)
BSNOX G/KW HR (G/HP HR)	5.27 (3.93)	8.88 (6.62)	9.75 (7.27)	8.31 (6.20)
BSFC KG/KW HR (LB/HP HR)	.925 (1.521)	.440 (.723)	.301 (.495)	.597 (.981)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	9.86	(13.23)
BSHC G/KW HR (G/HP HR)	6.21	(4.63)
BSCO G/KW HR (G/HP HR)	80.13	(59.75)
BSCO2 G/KW HR (G/HP HR)	1070	(798)
BSNOX G/KW HR (G/HP HR)	9.24	(6.89)
BSFC KG/KW HR (LB/HP HR)	.383	(.630)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW - SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00	(0.0)

TABLE F-8A (CONT'D). TEST 7-2 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH454
ENGINE MODEL 79 CHEV 454
ENGINE 7.4 L(454 CID) V-8
CVS NO. 9

TEST NO. 7-2 RUN
DATE 1/31/79
TIME 09:25
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 751.08 MM HG(29.57 IN HG)
DRY BULB TEMP. 26.1 DEG C(79.0 DEG F)

RELATIVE HUMIDITY 15 PCT
ABSOLUTE HUMIDITY 3.2 GM/KG(22.3 GRAINS/LB)

NOX HUMIDITY C.F. .8015

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8087	8319	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.7 (6523)	208.0 (7348)	212.4 (7501)	184.4 (6514)
HC SAMPLE METER/RANGE/PPM	78.4/ 2/ 78	85.0/ 2/ 85	65.9/ 2/ 66	47.5/ 2/ 48
HC BCKGRD METER/RANGE/PPM	4.1/ 2/ 4	6.0/ 2/ 6	7.2/ 2/ 7	6.0/ 2/ 6
CO SAMPLE METER/RANGE/PPM	23.5/ 3/ 697	24.1/ 3/ 715	41.0/ 3/ 1208	20.0/ 3/ 595
CO BCKGRD METER/RANGE/PPM	1.1/ 3/ 34	.4/ 3/ 12	.6/ 3/ 18	.4/ 3/ 12
CO2 SAMPLE METER/RANGE/PCT	26.0/ 3/ .43	39.9/ 3/ .68	88.4/ 3/ 1.65	25.6/ 3/ .42
CO2 BCKGRD METER/RANGE/PCT	2.0/ 3/ .03	2.3/ 3/ .04	1.6/ 3/ .02	1.7/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	8.4/ 3/ 25	18.1/ 3/ 54	64.9/ 3/ 195	7.3/ 3/ 22
NOX BCKGRD METER/RANGE/PPM	.1/ 3/ 0	.1/ 3/ 0	.2/ 3/ 1	.3/ 3/ 1
DILUTION FACTOR	26.63	17.77	7.57	27.74
HC CONCENTRATION PPM	74	79	60	42
CO CONCENTRATION PPM	656	690	1148	575
CO2 CONCENTRATION PCT	.40	.64	1.63	.39
NOX CONCENTRATION PPM	24.9	54.0	194.2	21.0
HC MASS GRAMS	7.93	9.52	7.31	4.44
CO MASS GRAMS	141.04	167.23	283.93	123.59
CO2 MASS GRAMS	1343.6	2446.7	6323.3	1333.0
NOX MASS GRAMS	7.05	17.23	63.23	5.95
FUEL KG (LB)	.501 (1.11)	.864 (1.90)	2.141 (4.72)	.486 (1.07)
KW HR (HP HR)	.89 (1.19)	2.05 (2.75)	6.62 (8.88)	.89 (1.20)
BSHC G/KW HR (G/HP HR)	8.94 (6.67)	4.65 (3.47)	1.10 (.82)	4.98 (3.71)
BSCO G/KW HR (G/HP HR)	159.01 (118.57)	81.65 (60.88)	42.89 (31.98)	138.62 (103.37)
BSCO2 G/KW HR (G/HP HR)	1514.76 (1129.56)	1194.50 (890.74)	955.13 (712.24)	1495.18 (1114.95)
BSNOX G/KW HR (G/HP HR)	7.95 (5.93)	8.41 (6.27)	9.55 (7.12)	6.67 (4.97)
BSFC KG/KW HR (LB/HP HR)	.565 (.929)	.422 (.693)	.323 (.532)	.545 (.896)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	10.45 (14.01)
BSHC G/KW HR (G/HP HR)	2.79 (2.08)
BSCO G/KW HR (G/HP HR)	68.52 (51.09)
BSCO2 G/KW HR (G/HP HR)	1096 (817)
BSNOX G/KW HR (G/HP HR)	8.95 (6.67)
BSFC KG/KW HR (LB/HP HR)	.382 (.628)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-8B. TEST 7-3 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.CH454
ENGINE MODEL 79 CHEV 454
ENGINE 7.4 L(454 CID) V-8
CVS NO. 9

TEST NO. 7-3 RUN
DATE 2/ 1/79
TIME 0815
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 748.54 MM HG(29.47 IN HG)
DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)

RELATIVE HUMIDITY 15 PCT
ABSOLUTE HUMIDITY 3.4 GM/KG(23.8 GRAINS/LB)

NOX HUMIDITY C.F. .8059

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7168	8089	8319	7165
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.1 (6501)	207.3 (7323)	211.6 (7474)	183.8 (6492)
HC SAMPLE METER/RANGE/PPM	41.4/ 3/ 414	18.5/ 3/ 185	7.6/ 3/ 76	45.8/ 2/ 46
HC BCKGRD METER/RANGE/PPM	.6/ 3/ 6	1.1/ 3/ 11	.9/ 3/ 9	5.3/ 2/ 5
CO SAMPLE METER/RANGE/PPM	32.3/ 3/ 954	30.0/ 3/ 887	37.9/ 3/ 1117	19.2/ 3/ 571
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.5/ 3/ 15	.5/ 3/ 15	.9/ 3/ 28
CO2 SAMPLE METER/RANGE/PCT	24.1/ 3/ .39	41.2/ 3/ .70	85.9/ 3/ 1.59	26.9/ 3/ .44
CO2 BCKGRD METER/RANGE/PCT	3.5/ 3/ .05	2.6/ 3/ .04	3.4/ 3/ .05	2.8/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	13.1/ 2/ 13	53.8/ 2/ 54	64.7/ 3/ 194	19.2/ 2/ 19
NOX BCKGRD METER/RANGE/PPM	.6/ 2/ 1	.5/ 2/ 1	.2/ 3/ 1	.9/ 2/ 0
DILUTION FACTOR	25.32	16.65	7.86	26.62
HC CONCENTRATION PPM	408	175	68	41
CO CONCENTRATION PPM	919	856	1064	537
CO2 CONCENTRATION PCT	.34	.66	1.55	.40
NOX CONCENTRATION PPM	12.5	53.3	193.6	18.8
HC MASS GRAMS	43.34	20.89	8.32	4.31
CO MASS GRAMS	196.87	206.71	262.31	115.05
CO2 MASS GRAMS	1152.7	2513.0	5987.8	1350.2
NOX MASS GRAMS	3.55	17.05	63.15	5.33
FUEL KG (LB)	.504 (1.11)	.916 (2.02)	2.026 (4.47)	.487 (1.07)
KW HR (HP HR)	.62 (.83)	2.08 (2.79)	6.68 (8.96)	.91 (1.23)
BSHC G/KW HR (G/HP HR)	70.21 (52.36)	10.04 (7.49)	1.24 (.93)	4.72 (3.52)
BSCO G/KW HR (G/HP HR)	318.96 (237.85)	99.37 (74.10)	39.24 (29.26)	125.82 (93.82)
BSCO2 G/KW HR (G/HP HR)	1867.56 (1392.64)	1208.03 (900.83)	895.79 (667.99)	1476.63 (1101.12)
BSNOX G/KW HR (G/HP HR)	5.76 (4.29)	8.19 (6.11)	9.45 (7.05)	5.83 (4.35)
BSFC KG/KW HR (LB/HP HR)	.817 (1.343)	.440 (.723)	.303 (.498)	.533 (.875)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	10.30 (13.81)
BSHC G/KW HR (G/HP HR)	7.46 (5.57)
BSCO G/KW HR (G/HP HR)	75.85 (56.56)
BSCO2 G/KW HR (G/HP HR)	1069 (797)
BSNOX G/KW HR (G/HP HR)	8.65 (6.45)
BSFC KG/KW HR (LB/HP HR)	.382 (.628)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-8B (CONT'D). TEST 7-3 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.CH454
ENGINE MODEL 79 CHEV 454
ENGINE 7.4 L(454 CID) V-8
CVS NO. 9

TEST NO. 7-3 RUN
DATE 2/ 1/79
TIME 09:24
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 748.54 MM HG(29.47 IN HG)
DRY BULB TEMP. 25.6 DEG C(78.0 DEG F)

RELATIVE HUMIDITY 15 PCT
ABSOLUTE HUMIDITY 3.1 GM/KG(21.5 GRAINS/LB)

NOX HUMIDITY C.F. .7991

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7168	8089	8320	7166
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	184.1 (6501)	207.3 (7323)	211.6 (7475)	183.8 (6493)
HC SAMPLE METER/RANGE/PPM	83.1/ 2/ 83	80.4/ 2/ 80	64.2/ 2/ 64	48.4/ 2/ 48
HC BCKGRD METER/RANGE/PPM	6.0/ 2/ 6	7.0/ 2/ 7	6.8/ 2/ 7	7.3/ 2/ 7
CO SAMPLE METER/RANGE/PPM	24.5/ 3/ 726	25.2/ 3/ 747	36.7/ 3/ 1082	20.4/ 3/ 607
CO BCKGRD METER/RANGE/PPM	.6/ 3/ 18	.4/ 3/ 12	1.0/ 3/ 31	1.2/ 3/ 37
CO2 SAMPLE METER/RANGE/PCT	24.9/ 3/ .41	39.8/ 3/ .67	84.8/ 3/ 1.57	27.5/ 3/ .45
CO2 BCKGRD METER/RANGE/PCT	3.0/ 3/ .05	3.1/ 3/ .05	3.3/ 3/ .05	3.5/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	20.6/ 2/ 21	46.0/ 2/ 46	66.4/ 3/ 149	18.9/ 2/ 19
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.6/ 2/ 1	.3/ 3/ 1	.5/ 2/ 1
DILUTION FACTOR	27.49	27.75	7.99	25.89
HC CONCENTRATION PPM	77	74	58	41
CO CONCENTRATION PPM	699	722	1018	563
CO2 CONCENTRATION PCT	.36	.63	1.52	.40
NOX CONCENTRATION PPM	20.1	45.4	198.4	18.4
HC MASS GRAMS	8.21	8.83	7.11	4.39
CO MASS GRAMS	149.91	174.30	250.84	120.58
CO2 MASS GRAMS	1224.1	2387.3	5898.5	1350.9
NOX MASS GRAMS	5.66	14.40	64.19	5.18
FUEL KG (LB)	.468 (1.03)	.848 (1.87)	1.991 (4.39)	.490 (1.08)
KW HR (HP HR)	.92 (1.23)	2.11 (2.83)	6.71 (9.00)	.92 (1.23)
BSHC G/KW HR (G/HP HR)	8.93 (6.66)	4.18 (3.12)	1.06 (.79)	4.77 (3.56)
BSCO G/KW HR (G/HP HR)	163.13 (121.65)	82.52 (61.53)	37.37 (27.87)	131.21 (97.85)
BSCO2 G/KW HR (G/HP HR)	1332.06 (993.32)	1130.22 (842.81)	878.83 (655.35)	1470.03 (1096.20)
BSNOX G/KW HR (G/HP HR)	6.16 (4.59)	6.82 (5.08)	9.56 (7.13)	5.63 (4.20)
BSFC KG/KW HR (LB/HP HR)	.510 (.838)	.401 (.660)	.297 (.488)	.533 (.877)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	10.66 (14.30)	
BSHC G/KW HR (G/HP HR)	2.68 (2.00)	
BSCO G/KW HR (G/HP HR)	65.24 (48.65)	
BSCO2 G/KW HR (G/HP HR)	1019 (760)	
BSNOX G/KW HR (G/HP HR)	8.39 (6.25)	
BSFC KG/KW HR (LB/HP HR)	.356 (.585)	

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-9A. TEST 8-4 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 8-4 RUN
DATE 2/16/79
TIME 09:54
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 747.52 MM HG(29.43 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 18 PCT
ABSOLUTE HUMIDITY 3.5 GM/KG(24.5 GRAINS/LB) NOX HUMIDITY C.F. .8082

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8086	8314	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.8 (6491)	207.0 (7310)	211.2 (7459)	183.5 (6481)
HC SAMPLE METER/RANGE/PPM	58.0/ 3/ 580	50.0/ 3/ 500	25.0/ 3/ 250	46.6/ 2/ 47
HC BCKGRD METER/RANGE/PPM	1.0/ 3/ 10	1.0/ 3/ 10	1.1/ 3/ 11	10.2/ 2/ 10
CO SAMPLE METER/RANGE/PPM	46.0/ 3/ 1355	51.8/ 3/ 1525	56.2/ 3/ 1655	12.4/ 3/ 372
CO BCKGRD METER/RANGE/PPM	.3/ 3/ 9	.1/ 3/ 3	.1/ 3/ 3	1.2/ 3/ 37
CO2 SAMPLE METER/RANGE/PCT	23.0/ 3/ .37	34.5/ 3/ .58	78.2/ 3/ 1.42	21.3/ 3/ .35
CO2 BCKGRD METER/RANGE/PCT	3.3/ 3/ .05	3.5/ 3/ .05	3.6/ 3/ .06	4.0/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	8.6/ 2/ 9	24.8/ 2/ 25	41.2/ 3/ 124	14.2/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.8/ 2/ 1	1.5/ 2/ 2	1.6/ 2/ 2
DILUTION FACTOR	23.67	17.24	8.33	34.66
HC CONCENTRATION PPM	570	491	240	37
CO CONCENTRATION PPM	1328	1497	1597	332
CO2 CONCENTRATION PCT	.33	.53	1.37	.29
NOX CONCENTRATION PPM	8.1	24.0	122.3	12.6
HC MASS GRAMS	60.46	58.56	29.27	3.88
CO MASS GRAMS	284.25	360.69	392.78	70.89
CO2 MASS GRAMS	1097.4	1996.7	5316.1	959.7
NOX MASS GRAMS	2.31	2.69	39.92	3.59
FUEL KG (LB)	.547 (1.21)	.867 (1.91)	1.900 (4.19)	.342 (.75)
KW HR (HP HR)	.77 (1.04)	1.72 (2.30)	5.43 (7.28)	.75 (1.01)
BSHC G/KW HR (G/HP HR)	78.31 (58.40)	34.11 (25.44)	5.39 (4.02)	5.15 (3.84)
BSCO G/KW HR (G/HP HR)	368.17 (274.55)	210.11 (156.68)	72.38 (53.97)	94.03 (70.12)
BSCO2 G/KW HR (G/HP HR)	1421.39 (1059.93)	1163.13 (867.35)	979.58 (730.47)	1273.05 (949.31)
BSNOX G/KW HR (G/HP HR)	2.99 (2.23)	4.98 (3.34)	7.36 (5.49)	4.76 (3.55)
BSFC KG/KW HR (LB/HP HR)	.709 (1.165)	.505 (.830)	.350 (.575)	.453 (.745)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.67	(11.63)
BSHC G/KW HR (G/HP HR)	17.55	(13.09)
BSCO G/KW HR (G/HP HR)	127.87	(95.36)
BSCO2 G/KW HR (G/HP HR)	1081	(806)
BSNOX G/KW HR (G/HP HR)	6.17	(4.60)
BSFC KG/KW HR (LB/HP HR)	.422	(.693)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-9A (CONT'D). TEST 8-4 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 8-4 RUN
DATE 2/16/79
TIME 10:34
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 747.52 MM HG(29.43 IN HG)
DRY BULB TEMP. 24.4 DEG C(76.0 DEG F)

RELATIVE HUMIDITY 18 PCT
ABSOLUTE HUMIDITY 3.5 GM/KG(24.4 GRAINS/LB)

NOX HUMIDITY C.F. .8077

BAG RESULTS

	1	2	3	4
BAG NUMBER	NYNF	LANF	LAF	NYNF
DESCRIPTION				
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7165	8086	8314	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	183.7 (6489)	207.0 (7310)	211.2 (7459)	183.5 (6481)
HC SAMPLE METER/RANGE/PPM	7.5/ 3/ 75	8.5/ 3/ 85	5.4/ 3/ 54	47.0/ 2/ 47
HC BCKGRD METER/RANGE/PPM	.9/ 3/ 9	1.0/ 3/ 10	1.0/ 3/ 10	5.1/ 2/ 5
CO SAMPLE METER/RANGE/PPM	22.3/ 3/ 662	23.8/ 3/ 706	36.1/ 3/ 1065	12.9/ 3/ 387
CO BCKGRD METER/RANGE/PPM	.4/ 3/ 12	1.3/ 3/ 40	2.5/ 3/ 76	1.6/ 3/ 49
CO2 SAMPLE METER/RANGE/PCT	21.9/ 3/ .36	34.8/ 3/ .58	78.9/ 3/ 1.44	21.1/ 3/ .34
CO2 BCKGRD METER/RANGE/PCT	3.4/ 3/ .05	3.7/ 3/ .06	5.4/ 3/ .08	3.4/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	12.1/ 2/ 12	30.2/ 2/ 30	45.5/ 3/ 136	13.9/ 2/ 14
NOX BCKGRD METER/RANGE/PPM	.5/ 2/ 1	.5/ 2/ 1	.1/ 3/ 0	.5/ 2/ 1
DILUTION FACTOR	31.28	20.28	8.67	34.83
HC CONCENTRATION PPM	66	75	95	42
CO CONCENTRATION PPM	642	656	962	335
CO2 CONCENTRATION PCT	.31	.53	1.36	.29
NOX CONCENTRATION PPM	11.6	24.7	136.2	13.4
HC MASS GRAMS	7.02	9.01	5.50	4.45
CO MASS GRAMS	137.32	158.17	236.59	71.49
CO2 MASS GRAMS	1026.5	2004.2	5276.4	978.6
NOX MASS GRAMS	3.30	9.51	44.45	3.80
FUEL KG (LB)	.394 (.88)	.719 (1.59)	1.786 (3.94)	.348 (.77)
KW HR (HP HR)	.81 (1.08)	1.69 (2.27)	5.42 (7.27)	.75 (1.00)
BSHC G/KW HR (G/HP HR)	8.69 (6.48)	5.32 (3.97)	1.01 (.76)	5.94 (4.43)
BSCO G/KW HR (G/HP HR)	169.87 (126.67)	93.37 (69.63)	43.63 (32.54)	95.41 (71.15)
BSCO2 G/KW HR (G/HP HR)	1269.88 (946.95)	1183.15 (882.28)	973.07 (725.62)	1306.00 (973.88)
BSNOX G/KW HR (G/HP HR)	4.08 (3.04)	5.61 (4.18)	8.20 (6.11)	5.08 (3.78)
BSFC KG/KW HR (LB/HP HR)	.493 (.811)	.425 (.698)	.329 (.541)	.465 (.764)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.67	(11.63)
BSHC G/KW HR (G/HP HR)	3.00	(2.23)
BSCO G/KW HR (G/HP HR)	69.58	(51.89)
BSCO2 G/KW HR (G/HP HR)	1071	(798)
BSNOX G/KW HR (G/HP HR)	7.04	(5.25)
BSFC KG/KW HR (LB/HP HR)	.375	(.616)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR G/TEST	0.000	
MULTIPLIER FOR G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW SCM(SCF)	0.00	(0.0)

TABLE F-9B. TEST 8-5 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 4

TEST NO. 8-5 RUN
DATE 2/21/79
TIME 08:53
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.93 MM HG(29.21 IN HG)
DRY BULB TEMP. 27.2 DEG C(81.0 DEG F)

RELATIVE HUMIDITY 26 PCT
ABSOLUTE HUMIDITY 5.9 GM/KG(41.2 GRAINS/LB)

NOX HUMIDITY C.F. .8630

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8087	8315	7164
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.3 (6439)	205.4 (7253)	209.5 (7401)	182.1 (6431)
HC SAMPLE METER/RANGE/PPM	38.0/ 3/ 380	41.0/ 3/ 410	24.2/ 3/ 242	53.3/ 2/ 53
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.5/ 3/ 15	1.6/ 3/ 16	12.1/ 2/ 12
CO SAMPLE METER/RANGE/PPM	37.0/ 3/ 1091	46.1/ 3/ 1358	57.0/ 3/ 1678	11.7/ 3/ 351
CO BCKGRD METER/RANGE/PPM	.3/ 3/ 9	.1/ 3/ 3	.3/ 3/ 9	.8/ 3/ 24
CO2 SAMPLE METER/RANGE/PCT	22.5/ 3/ .37	34.1/ 3/ .57	76.7/ 3/ 1.39	19.7/ 3/ .32
CO2 BCKGRD METER/RANGE/PCT	3.1/ 3/ .05	2.6/ 3/ .04	2.3/ 3/ .04	2.1/ 3/ .03
NOX SAMPLE METER/RANGE/PPM	6.7/ 2/ 7	21.7/ 2/ 22	97.3/ 2/ 97	11.7/ 2/ 12
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.2/ 2/ 0	.3/ 2/ 0	.4/ 2/ 0
DILUTION FACTOR	26.21	18.00	8.49	37.44
HC CONCENTRATION PPM	369	396	228	42
CO CONCENTRATION PPM	1066	1329	1612	322
CO2 CONCENTRATION PCT	.32	.53	1.36	.29
NOX CONCENTRATION PPM	6.4	21.5	97.0	11.3
HC MASS GRAMS	38.85	46.89	27.54	4.36
CO MASS GRAMS	226.22	317.74	393.21	68.37
CO2 MASS GRAMS	1069.2	2003.1	5220.6	956.2
NOX MASS GRAMS	1.93	7.29	33.57	3.40
FUEL KG (LB)	.488 (1.08)	.836 (1.84)	1.868 (4.12)	.340 (.75)
KW HR (HP HR)	.69 (.93)	1.68 (2.26)	5.28 (7.08)	.74 (.99)
BSHC G/KW HR (G/HP HR)	56.28 (41.96)	27.83 (20.75)	5.22 (3.89)	5.93 (4.42)
BSCO G/KW HR (G/HP HR)	327.71 (244.38)	188.58 (140.63)	74.51 (55.56)	92.93 (69.30)
BSCO2 G/KW HR (G/HP HR)	1548.90 (1155.02)	1188.89 (886.56)	989.30 (737.72)	1299.69 (969.18)
BSNOX G/KW HR (G/HP HR)	2.80 (2.08)	4.33 (3.23)	6.36 (4.74)	4.62 (3.45)
BSFC KG/KW HR (LB/HP HR)	.707 (1.162)	.496 (.815)	.354 (.582)	.462 (.759)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.39	(11.25)
BSHC G/KW HR (G/HP HR)	14.02	(10.46)
BSCO G/KW HR (G/HP HR)	119.88	(89.39)
BSCO2 G/KW HR (G/HP HR)	1103	(822)
BSNOX G/KW HR (G/HP HR)	5.51	(4.11)
BSFC KG/KW HR (LB/HP HR)	.421	(.692)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-9B (CONT'D). TEST 8-5 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.IH404
ENGINE MODEL 79 IH 404
ENGINE 6.6 L(404 CID) V-8
CVS NO. 9

TEST NO. 8-5 RUN
DATE 2/21/79
TIME 09:35 — GASOLINE EM-267-F
DYNO NO. 2 — BAG CART NO. 2

BAROMETER 741.93 MM HG(29.21 IN HG)
DRY BULB TEMP. 25.0 DEG C(77.0 DEG F)

RELATIVE HUMIDITY 27 PCT
ABSOLUTE HUMIDITY 5.4 GM/KG(37.8 GRAINS/LB) — NOX HUMIDITY C.F. .8513

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7163	8083	8313	7161
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.2 (6436)	205.3 (7250)	209.5 (7399)	182.0 (6428)
HC SAMPLE METER/RANGE/PPM	9.8/ 3/ 98	9.5/ 3/ 95	6.7/ 3/ 67	62.4/ 2/ 62
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.1/ 3/ 11	1.4/ 3/ 14	12.0/ 2/ 12
CO SAMPLE METER/RANGE/PPM	18.8/ 3/ 560	20.0/ 3/ 595	38.0/ 3/ 1120	14.1/ 3/ 422
CO BCKGRD METER/RANGE/PPM	.5/ 3/ 15	.4/ 3/ 12	.7/ 3/ 21	1.5/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	19.7/ 3/ .32	33.7/ 3/ .56	77.8/ 3/ 1.41	20.3/ 3/ .33
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .04	2.7/ 3/ .04	2.8/ 3/ .04	2.5/ 3/ .04
NOX SAMPLE METER/RANGE/PPM	9.5/ 2/ 10	26.8/ 2/ 27	40.0/ 3/ 120	11.2/ 2/ 11
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.4/ 2/ 0	.5/ 2/ 1	.4/ 2/ 0
DILUTION FACTOR	35.00	21.24	8.76	35.64
HC CONCENTRATION PPM	87	85	55	51
CO CONCENTRATION PPM	537	572	1061	371
CO2 CONCENTRATION PCT	.28	.52	1.38	.29
NOX CONCENTRATION PPM	9.2	26.4	119.6	10.8
HC MASS GRAMS	9.18	10.01	6.60	5.33
CO MASS GRAMS	113.89	136.65	258.87	78.72
CO2 MASS GRAMS	922.2	1968.3	5281.6	970.0
NOX MASS GRAMS	2.73	8.83	40.78	3.20
FUEL KG (LB)	.356 (.79)	.698 (1.54)	1.800 (3.97)	.350 (.77)
KW HR (HP HR)	.72 (.96)	1.64 (2.20)	5.28 (7.08)	.73 (.98)
BSHC G/KW HR (G/HP HR)	12.79 (9.54)	6.09 (4.54)	1.25 (.93)	7.28 (5.43)
BSCO G/KW HR (G/HP HR)	158.73 (118.36)	83.12 (61.98)	49.06 (36.58)	107.67 (80.29)
BSCO2 G/KW HR (G/HP HR)	1285.17 (958.35)	1197.28 (892.81)	1000.85 (746.34)	1326.71 (989.33)
BSNOX G/KW HR (G/HP HR)	3.81 (2.84)	5.37 (4.01)	7.73 (5.76)	4.38 (3.27)
BSFC KG/KW HR (LB/HP HR)	.497 (.816)	.425 (.698)	.341 (.561)	.479 (.787)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	8.37 (11.22)
BSHC G/KW HR (G/HP HR)	3.72 (2.77)
BSCO G/KW HR (G/HP HR)	70.27 (52.40)
BSCO2 G/KW HR (G/HP HR)	1092 (815)
BSNOX G/KW HR (G/HP HR)	6.64 (4.95)
BSFC KG/KW HR (LB/HP HR)	.383 (.629)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-10A. TEST 10-1 EMISSIONS RESULTS

COLD TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.GM292
ENGINE MODEL =0 GM 292
ENGINE 4.8 L(292 CID) V-8
CVS NO. 4

TEST NO. 10-1 RUN
DATE 4/20/79
TIME 11:19
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 27.8 DEG C(82.0 DEG F)

RELATIVE HUMIDITY 60 PCT
ABSOLUTE HUMIDITY 14.5 GM/KG(101.4 GRAINS/LB)

NOX HUMIDITY C.F. 1.1415

BAG RESULTS	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7169	8084	8316	7161
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.1 (6432)	205.1 (7245)	209.4 (7396)	181.4 (6423)
HC SAMPLE METER/RANGE/PPM	43.2/ 3/ 432	11.9/ 3/ 119	7.9/ 3/ 79	8.1/ 3/ 81
HC BCKGRD METER/RANGE/PPM	1.5/ 3/ 15	1.5/ 3/ 15	1.9/ 3/ 19	1.9/ 3/ 19
CO SAMPLE METER/RANGE/PPM	49.7/ 3/ 1964	21.6/ 3/ 642	46.0/ 3/ 1355	10.0/ 3/ 301
CO BCKGRD METER/RANGE/PPM	1.0/ 3/ 31	.8/ 3/ 24	1.3/ 3/ 40	1.5/ 3/ 46
CO2 SAMPLE METER/RANGE/PCT	14.3/ 3/ .23	23.7/ 3/ .39	54.4/ 3/ .45	15.1/ 3/ .24
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .09	2.9/ 3/ .09	3.4/ 3/ .05	3.1/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	10.0/ 2/ 10	50.2/ 2/ 50	59.7/ 3/ 179	29.4/ 2/ 29
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.1/ 2/ 0	.1/ 3/ 0	.4/ 2/ 0
DILUTION FACTOR	32.42	29.07	12.35	48.20
HC CONCENTRATION PPM	417	105	66	67
CO CONCENTRATION PPM	1900	601	1268	250
CO2 CONCENTRATION PCT	.19	.34	.90	.19
NOX CONCENTRATION PPM	4.8	50.1	178.8	24.0
HC MASS GRAMS	43.85	12.37	7.99	7.06
CO MASS GRAMS	296.80	143.61	309.18	52.86
CO2 MASS GRAMS	619.4	1291.4	3446.0	646.3
NOX MASS GRAMS	3.90	22.44	81.77	9.53
FUEL KG (LB)	.386 (.85)	.491 (1.08)	1.247 (2.75)	.237 (.52)
KW HR (HP HR)	.64 (.86)	1.23 (1.64)	3.74 (5.01)	.52 (.70)
BSHC G/KW HR (G/HP HR)	68.27 (51.28)	10.08 (7.52)	2.14 (1.59)	13.46 (10.04)
BSCO G/KW HR (G/HP HR)	465.47 (347.10)	117.12 (87.33)	82.69 (61.66)	100.79 (75.16)
BSCO2 G/KW HR (G/HP HR)	971.42 (724.39)	1053.15 (785.33)	921.41 (687.25)	1232.26 (918.90)
BSNOX G/KW HR (G/HP HR)	6.12 (4.56)	18.30 (13.65)	21.87 (16.31)	18.18 (13.56)
BSFC KG/KW HR (LB/HP HR)	.606 (.996)	.400 (.658)	.334 (.548)	.452 (.743)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.13 (	8.22)
BSHC G/KW HR (G/HP HR)	11.63 (	8.67)
BSCO G/KW HR (G/HP HR)	130.96 (	97.66)
BSCO2 G/KW HR (G/HP HR)	980 (	731)
BSNOX G/KW HR (G/HP HR)	14.20 (	14.32)
BSFC KG/KW HR (LB/HP HR)	.385 (	.634)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-10A (CONT'D). TEST 10-1 EMISSIONS RESULTS

HOT TRANSIENT — PROJECT NO. 11-5099-001

ENGINE NO.GM292
ENGINE MODEL -0 GM 292
ENGINE 4.8 L(292 CID) V-8
CVS NO. 9

TEST NO. 10-1 RUN
DATE 9/20/79
TIME
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 30.6 DEG C(87.0 DEG F)

RELATIVE HUMIDITY 96 PCT
ABSOLUTE HUMIDITY 12.9 GM/KG(90.6 GRAINS/LB) NOX HUMIDITY C.F. 1.0790

BAG RESULTS

BAG NUMBER	1	2	3	4
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H20(IN. H20)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H20(IN. H20)	457.2 (18.0)	472.9 (18.6)	541.0 (21.3)	469.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.9 (130.0)	54.9 (130.0)	54.9 (130.0)	54.9 (130.0)
BLOWER REVOLUTIONS	7163	8089	8318	7163
TIME SECONDS	272.0	307.0	315.9	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.1 (6431)	205.1 (7245)	209.5 (7398)	181.9 (6425)
HC SAMPLE METER/RANGE/PPM	99.8/ 3/ 998	9.6/ 3/ 96	7.3/ 3/ 73	7.7/ 3/ 77
HC BCKGRD METER/RANGE/PPM	1.1/ 3/ 11	1.9/ 3/ 19	1.2/ 3/ 12	1.1/ 3/ 11
CO SAMPLE METER/RANGE/PPM	93.6/ 3/ 1289	18.3/ 3/ 545	95.5/ 3/ 1390	10.7/ 3/ 322
CO BCKGRD METER/RANGE/PPM	.7/ 3/ 21	.5/ 3/ 15	.9/ 3/ 28	1.6/ 3/ 49
CO2 SAMPLE METER/RANGE/PCT	19.9/ 3/ .23	23.9/ 3/ .39	55.9/ 3/ .97	19.8/ 3/ .29
CO2 BCKGRD METER/RANGE/PCT	2.5/ 3/ .09	2.9/ 3/ .09	2.6/ 3/ .09	3.0/ 3/ .05
NOX SAMPLE METER/RANGE/PPM	9.3/ 2/ 9	53.0/ 2/ 53	63.7/ 3/ 191	29.6/ 2/ 25
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.3/ 2/ 0	.3/ 3/ 1	.9/ 2/ 0
DILUTION FACTOR	33.53	29.58	12.15	48.77
HC CONCENTRATION PPM	937	82	62	66
CO CONCENTRATION PPM	1239	518	1270	268
CO2 CONCENTRATION PCT	.19	.35	.93	.19
NOX CONCENTRATION PPM	9.1	52.7	190.3	29.2
HC MASS GRAMS	95.93	9.76	7.49	6.95
CO MASS GRAMS	262.73	123.83	309.86	56.81
CO2 MASS GRAMS	639.7	1332.3	3569.1	634.8
NOX MASS GRAMS	3.92	22.32	82.26	9.09
FUEL KG (LB)	.378 (.83)	.491 (1.08)	1.285 (2.83)	.235 (.52)
KW HR (HP HR)	.68 (.91)	1.23 (1.65)	3.76 (5.04)	.59 (.72)
BSHC G/KW HR (G/HP HR)	67.63 (50.43)	7.91 (5.90)	1.99 (1.49)	12.97 (9.67)
BSCO G/KW HR (G/HP HR)	386.86 (288.48)	100.37 (74.85)	82.45 (61.49)	106.09 (79.08)
BSCO2 G/KW HR (G/HP HR)	941.91 (702.38)	1079.88 (805.26)	948.42 (707.24)	1184.91 (883.58)
BSNOX G/KW HR (G/HP HR)	5.09 (3.76)	18.09 (13.49)	21.89 (16.32)	16.96 (12.65)
BSFC KG/KW HR (LB/HP HR)	.556 (.919)	.398 (.659)	.342 (.562)	.939 (.722)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.21 (	8.32)
BSHC G/KW HR (G/HP HR)	11.30 (	8.43)
BSCO G/KW HR (G/HP HR)	121.36 (	90.50)
BSCO2 G/KW HR (G/HP HR)	994 (	741)
BSNOX G/KW HR (G/HP HR)	18.86 (	14.07)
BSFC KG/KW HR (LB/HP HR)	.385 (	.633)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-10B. TEST 10-2 EMISSIONS RESULTS

COLD TRANSIENT — PROJECT NO. 11-5044-001

ENGINE NO.GM292
ENGINE MODEL -0 GM 292
ENGINE 4.8 L(292 CID) V-8
CVS NO. 4

TEST NO. 10-2 RUN
DATE 4/23/79
TIME 09:12
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 27.8 DEG C(82.0 DEG F)

RELATIVE HUMIDITY 42 PCT
ABSOLUTE HUMIDITY 10.0 GM/KG(69.9 GRAINS/LB) NOX HUMIDITY C.F. .9768

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYUF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.4 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)	54.4 (130.0)
BLOWER REVOLUTIONS	7167	8086	8318	7163
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.2 (6435)	205.2 (7247)	209.5 (7398)	181.4 (6425)
HC SAMPLE METER/RANGE/PPM	67.6/ 3/ 676	14.1/ 3/ 141	10.2/ 3/ 102	11.0/ 3/ 110
HC BCKGRD METER/RANGE/PPM	2.1/ 3/ 21	2.2/ 3/ 22	1.9/ 3/ 19	1.5/ 3/ 15
CO SAMPLE METER/RANGE/PPM	57.4/ 3/ 1690	20.4/ 3/ 621	43.3/ 3/ 1276	10.8/ 3/ 325
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.7/ 3/ 21	1.1/ 3/ 34	2.0/ 3/ 61
CO2 SAMPLE METER/RANGE/PCT	16.0/ 3/ .24	25.0/ 3/ .41	56.3/ 3/ .98	15.4/ 3/ .25
CO2 BCKGRD METER/RANGE/PCT	4.0/ 3/ .06	3.8/ 3/ .06	3.8/ 3/ .06	3.4/ 3/ .06
NOX SAMPLE METER/RANGE/PPM	10.6/ 2/ 11	47.7/ 2/ 48	60.2/ 3/ 181	23.5/ 2/ 23
NOX BCKGRD METER/RANGE/PPM	.3/ 2/ 0	.4/ 2/ 0	.3/ 3/ 1	.4/ 2/ 1
DILUTION FACTOR	27.40	27.57	12.00	45.16
HC CONCENTRATION PPM	656	140	85	45
CO CONCENTRATION PPM	1636	588	1209	260
CO2 CONCENTRATION PCT	.20	.35	.93	.20
NOX CONCENTRATION PPM	10.3	47.3	179.8	22.6
HC MASS GRAMS	68.91	14.59	10.22	10.00
CO MASS GRAMS	347.05	140.38	293.60	55.02
CO2 MASS GRAMS	655.1	1326.3	3565.2	650.6
NOX MASS GRAMS	3.51	10.14	70.36	2.69
FUEL KG (LB)	.447 (.99)	.509 (1.11)	1.280 (2.82)	.242 (.53)
KW HR (HP HR)	.71 (.96)	1.24 (1.66)	3.78 (5.06)	.54 (.73)
BSHC G/KW HR (G/HP HR)	96.63 (72.06)	13.37 (9.97)	2.71 (2.02)	18.41 (13.73)
BSCO G/KW HR (G/HP HR)	486.68 (362.91)	113.44 (84.59)	77.74 (57.97)	101.26 (75.51)
BSCO2 G/KW HR (G/HP HR)	918.60 (685.00)	1071.68 (799.15)	943.97 (703.92)	1197.55 (893.01)
BSNOX G/KW HR (G/HP HR)	4.92 (3.67)	14.66 (10.93)	18.63 (13.89)	14.15 (10.55)
BSFC KG/KW HR (LB/HP HR)	.627 (1.031)	.407 (.670)	.339 (.557)	.446 (.733)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.27	(8.41)
BSHC G/KW HR (G/HP HR)	16.85	(12.57)
BSCO G/KW HR (G/HP HR)	133.32	(99.42)
BSCO2 G/KW HR (G/HP HR)	988	(737)
BSNOX G/KW HR (G/HP HR)	15.90	(11.86)
BSFC KG/KW HR (LB/HP HR)	.394	(.648)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000	(0.00)
MULTIPLIER FOR	G/TEST	0.000	
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000	(0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000	(0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00	(0.0)

TABLE F-10B (CONT'D). TEST 10-2 EMISSIONS RESULTS

HOT TRANSIENT

PROJECT NO. 11-5044-001

ENGINE NO.GM292
ENGINE MODEL -0 GM 292
ENGINE 4.8 L(292 CID) V-8
CVS NO. 9

TEST NO. 10-2 RUN
DATE 4/23/79
TIME 09:52
DYNO NO. 2

GASOLINE EM-267-F
BAG CART NO. 2

BAROMETER 741.43 MM HG(29.19 IN HG)
DRY BULB TEMP. 28.3 DEG C(83.0 DEG F)

RELATIVE HUMIDITY 48 PCT
ABSOLUTE HUMIDITY 9.8 GM/KG(68.8 GRAINS/LB)

NOX HUMIDITY C.F. .9716

BAG RESULTS

	1	2	3	4
BAG NUMBER				
DESCRIPTION	NYNF	LANF	LAF	NYNF
BLOWER DIF P MM. H2O(IN. H2O)	696.0 (27.4)	711.2 (28.0)	762.0 (30.0)	708.7 (27.9)
BLOWER INLET P MM. H2O(IN. H2O)	457.2 (18.0)	472.9 (18.6)	541.0 (21.3)	464.8 (18.3)
BLOWER INLET TEMP. DEG. C(DEG. F)	54.9 (130.0)	54.9 (130.0)	54.9 (130.0)	54.9 (130.0)
BLOWER REVOLUTIONS	7163	8085	8317	7161
TIME SECONDS	272.0	307.0	316.0	272.0
TOTAL FLOW STD. CU. METRES(SCF)	182.1 (6431)	205.2 (7246)	209.9 (7347)	181.9 (6423)
HC SAMPLE METER/RANGE/PPM	48.8/ 3/ 488	14.0/ 3/ 140	10.1/ 3/ 101	10.9/ 3/ 109
HC BCKGRD METER/RANGE/PPM	2.0/ 3/ 20	2.1/ 3/ 21	1.6/ 3/ 16	1.7/ 3/ 17
CO SAMPLE METER/RANGE/PPM	47.0/ 3/ 1384	18.6/ 3/ 554	42.4/ 3/ 1249	9.7/ 3/ 292
CO BCKGRD METER/RANGE/PPM	.8/ 3/ 24	.5/ 3/ 15	.7/ 3/ 21	.7/ 3/ 21
CO2 SAMPLE METER/RANGE/PCT	14.8/ 3/ .29	23.8/ 3/ .39	55.1/ 3/ .96	14.7/ 3/ .23
CO2 BCKGRD METER/RANGE/PCT	2.8/ 3/ .09	2.9/ 3/ .09	2.8/ 3/ .09	2.8/ 3/ .09
NOX SAMPLE METER/RANGE/PPM	8.7/ 2/ 9	50.7/ 2/ 51	64.7/ 3/ 194	24.5/ 2/ 24
NOX BCKGRD METER/RANGE/PPM	.2/ 2/ 0	.2/ 2/ 0	.3/ 3/ 1	.9/ 2/ 1
DILUTION FACTOR	31.88	29.35	12.28	49.00
HC CONCENTRATION PPM	469	120	86	92
CO CONCENTRATION PPM	1337	528	1191	266
CO2 CONCENTRATION PCT	.19	.35	.92	.19
NOX CONCENTRATION PPM	8.5	50.5	193.3	23.6
HC MASS GRAMS	49.22	14.17	10.42	9.69
CO MASS GRAMS	283.41	126.16	290.34	56.36
CO2 MASS GRAMS	647.1	1248.0	3530.6	639.2
NOX MASS GRAMS	2.88	14.26	75.23	7.98
FUEL KG (LB)	.394 (.87)	.486 (1.07)	1.267 (2.79)	.239 (.53)
KW HR (HP HR)	.72 (.96)	1.24 (1.66)	3.80 (5.10)	.54 (.73)
BSHC G/KW HR (G/HP HR)	68.65 (51.19)	11.41 (8.51)	2.74 (2.05)	17.83 (13.29)
BSCO G/KW HR (G/HP HR)	395.35 (294.81)	101.63 (75.79)	76.42 (56.98)	103.74 (77.36)
BSCO2 G/KW HR (G/HP HR)	902.63 (673.09)	1045.67 (779.76)	929.24 (692.94)	1176.48 (877.30)
BSNOX G/KW HR (G/HP HR)	4.02 (2.99)	15.51 (11.57)	19.80 (14.77)	14.69 (10.96)
BSFC KG/KW HR (LB/HP HR)	.549 (.903)	.391 (.643)	.334 (.548)	.440 (.723)

TOTAL TEST RESULTS 4 BAGS

TOTAL KW HR (HP HR)	6.30 (8.45)
BSHC G/KW HR (G/HP HR)	13.25 (9.88)
BSCO G/KW HR (G/HP HR)	120.03 (89.50)
BSCO2 G/KW HR (G/HP HR)	970 (724)
BSNOX G/KW HR (G/HP HR)	16.72 (12.47)
BSFC KG/KW HR (LB/HP HR)	.379 (.622)

PARTICULATE DATA, TOTAL FOR 4 BAGS

90MM FILTER

SAMPLE FLOW	SCM(SCF)	0.000 (0.00)
MULTIPLIER FOR	G/TEST	0.000
MULTIPLIER FOR	G/KW HR (G/HP HR)	0.0000 (0.0000)
MULTIPLIER FOR	G/KG FUEL (G/LB FUEL)	0.0000 (0.0000)

20 X 20 FILTERS

SAMPLE FLOW	SCM(SCF)	0.00 (0.0)

TABLE F-11A. ENGINE 1 NINE-MODE EMISSIONS RESULTS

1977-78 IH MV404 --- PROJECT 11-5044-001

09-21-78 TEST 11 DUR HRS IH404 BAROMETER 29.21 K= 1.098 HUM= 15.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	819	.537	10.01	31	10.637	1996	17	203	2	.232	R	R	R	0.0
2 25 PCT T	312	.541	12.14	119	12.717	12066	33	1038	41	.077	1.149	35.860	1.422	21.6
3 55 PCT T	808	.920	12.25	467	13.261	16012	110	2249	205	.147	1.826	37.299	3.415	44.9
4 25 PCT T	297	.191	11.90	178	12.129	12111	33	386	65	.077	1.162	13.508	2.269	21.3
5 10 PCT T	131	.147	11.33	97	11.992	9117	12	236	28	.057	1.097	21.397	2.539	8.2
6 25 PCT T	261	.191	11.79	183	12.010	12066	29	388	67	.077	1.069	14.151	2.993	20.4
7 90 PCT T	686	1.110	12.61	1492	13.798	22770	128	3700	897	.113	1.298	37.518	9.098	73.5
8 25 PCT T	219	.216	11.92	197	12.161	11931	23	410	67	.077	.806	14.366	2.363	21.3
9 C.T.	58	.165	9.80	56	9.971	5126	3	171	10	.143	R	R	R	0.0
1 25 PCT T	248	.219	11.90	185	12.147	11567	26	421	64	.077	.913	14.555	2.218	21.6
2 55 PCT T	598	.850	12.25	651	13.167	16193	83	2112	292	.147	1.326	33.811	4.672	96.6
3 25 PCT T	222	.225	11.90	199	12.150	11340	23	425	68	.077	.791	14.479	2.308	21.9
4 10 PCT T	89	.233	11.21	148	11.953	8301	7	341	39	.057	.608	28.860	3.311	8.8
5 25 PCT T	252	.238	11.97	201	12.236	11931	26	448	68	.077	.911	15.492	2.364	21.6
6 90 PCT T	664	1.420	12.73	1297	14.225	23541	125	4747	782	.113	1.239	47.217	7.780	75.0
7 25 PCT T	208	.230	11.90	208	12.153	11249	22	429	70	.077	.735	14.641	2.393	21.9
8 C.T.	61	.162	9.72	56	9.888	5171	4	171	11	.143	R	R	R	0.0
9 IDLE	1090	.412	10.07	32	10.602	1905	22	149	2	.232	R	R	R	0.0

MODE	ID	UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	4.4	R	R	.044	R	580	20.5	8.8	4.7	.3	4.5	0.0
2 25 PCT T		28.9	76	26.6	.919	1.4	.058	.559	2000	17.3	5.7	8.0	2.1	9.0	7.6
3 55 PCT T		60.2	158	35.3	.587	3.4	.060	.357	2000	16.6	36.0	32.8	19.7	22.8	30.1
4 25 PCT T		28.6	75	26.7	.935	2.3	.055	.569	2000	18.1	5.7	3.0	3.2	9.0	7.5
5 10 PCT T		11.0	29	20.1	1.820	2.5	.052	1.107	2000	19.1	1.5	1.3	1.0	5.0	2.1
6 25 PCT T		27.4	72	26.6	.970	2.4	.055	.590	2000	18.3	5.0	3.0	3.4	9.0	7.2
7 90 PCT T		98.6	259	50.2	.509	9.1	.063	.310	2000	15.9	32.3	41.6	66.0	24.9	38.0
8 25 PCT T		28.6	75	25.2	.882	2.4	.055	.537	2000	18.1	4.0	3.1	3.4	8.5	7.5
9 C.T.		0.0	0	11.3	R	R	.046	R	2000	21.9	1.0	2.4	1.0	7.1	0.0
1 25 PCT T		28.9	76	25.5	.881	2.2	.055	.536	2000	18.1	5.1	3.1	3.2	8.7	7.4
2 55 PCT T		62.5	164	35.7	.572	4.7	.060	.348	2000	16.7	30.7	29.3	27.4	23.3	30.4
3 25 PCT T		29.3	77	25.0	.853	2.3	.055	.519	2000	18.1	4.5	3.1	3.3	8.6	7.5
4 10 PCT T		11.8	31	18.3	1.550	3.3	.052	.943	2000	19.2	1.0	1.8	1.4	4.6	2.2
5 25 PCT T		28.9	76	25.2	.871	2.4	.056	.530	2000	18.0	5.1	3.3	3.4	8.6	7.4
6 90 PCT T		100.5	264	51.9	.516	7.8	.065	.314	2000	15.4	35.5	50.7	56.5	26.1	37.6
7 25 PCT T		29.3	77	24.8	.846	2.4	.055	.514	2000	18.1	4.2	3.1	3.5	8.5	7.5
8 C.T.		0.0	0	11.4	R	R	.045	R	2000	22.0	1.3	2.3	1.0	7.2	0.0
9 IDLE		0.0	0	4.2	R	R	.044	R	590	20.5	12.6	3.3	.3	4.3	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 2.0 46 7.0

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.8 47 6.9

TWO CYCLE COMPOSITE -

HC- FID	0.35(2.0) + 0.65(1.8) =	1.863	G/KW HR	(1.389 BS)
CO- NDIR	0.35(45.9) + 0.65(47.0) =	46.605	G/KW HR	(34.753 BS)
NOX-CL	0.35(7.0) + 0.65(6.9) =	6.972	G/KW HR	(5.199 BS)
	HC + NOX =	8.835	G/KW HR	(6.588 BS)
	SFC =	.960	KG/KW HR	(.756 BS)

TABLE F-11B. ENGINE 1 NINE-MODE EMISSIONS RESULTS

1977-78 IH MV404 --- PROJECT 11-5044-001

09-21-78 TEST 13 DUR HRS IH404

BAROMETER 29.16 K= 1.082 HUM= 14.4 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	820	.436	10.11	34	10.637	1950	17	162	2	.232	R	R	R	0.0
2 25 PCT T	346	.487	12.25	131	12.776	12020	37	926	44	.077	1.265	32.005	1.530	21.6
3 55 PCT T	846	.620	12.37	603	13.085	16239	118	1554	269	.147	1.928	25.350	4.384	45.7
4 25 PCT T	280	.198	11.90	180	12.129	11567	30	381	62	.077	1.033	13.172	2.130	21.6
5 10 PCT T	90	.286	11.10	150	11.396	7711	7	391	36	.057	.613	35.422	3.301	8.2
6 25 PCT T	257	.197	12.02	182	12.245	11476	27	372	61	.077	.957	13.214	2.174	21.0
7 90 PCT T	712	1.160	12.73	1537	13.971	22816	132	3827	902	.113	1.330	38.650	9.106	73.8
8 25 PCT T	210	.225	12.02	204	12.269	11431	22	424	68	.077	.748	14.454	2.328	21.9
9 C.T.	54	.156	9.59	53	9.752	9990	3	162	10	.143	R	R	R	0.0
1 25 PCT T	257	.231	12.02	196	12.280	11703	27	446	67	.077	.936	15.198	2.288	21.9
2 55 PCT T	610	.800	12.37	636	13.239	15876	82	1938	274	.147	1.353	31.806	4.496	45.4
3 25 PCT T	219	.249	12.02	205	12.294	11476	23	470	69	.077	.792	16.249	2.375	21.6
4 10 PCT T	115	.159	11.56	110	11.731	9072	10	248	31	.057	.841	20.973	2.588	8.8
5 25 PCT T	226	.249	12.02	208	12.294	11431	24	468	69	.077	.814	16.165	2.400	21.6
6 90 PCT T	610	1.360	12.85	1369	14.279	23133	112	4451	797	.113	1.133	44.951	8.046	73.8
7 25 PCT T	173	.251	12.14	207	12.410	11385	18	465	68	.077	.623	16.286	2.388	21.3
8 C.T.	49	.157	9.82	56	9.983	5216	3	166	11	.143	R	R	R	0.0
9 IDLE	866	.425	10.33	34	10.851	1860	16	147	2	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	4.3	R	R	.049	R	570	20.5	8.4	4.1	.3	4.5	0.0
2 25 PCT T		28.9	76	26.5	.916	1.5	.058	.557	2000	17.2	6.1	7.9	2.1	9.1	7.5
3 55 PCT T		61.3	161	35.8	.584	4.4	.060	.355	2000	16.8	37.9	25.2	24.2	23.5	30.3
4 25 PCT T		28.9	76	25.5	.881	2.1	.055	.536	2000	18.1	5.0	3.2	2.9	8.8	7.5
5 10 PCT T		11.0	29	17.0	1.539	3.3	.052	.936	2000	19.2	.8	2.5	1.3	4.3	2.1
6 25 PCT T		28.2	74	25.3	.898	2.2	.056	.546	2000	18.0	4.5	3.2	2.9	8.7	7.3
7 90 PCT T		99.0	260	50.3	.508	9.1	.064	.309	2000	15.7	32.5	47.7	62.3	25.4	37.7
8 25 PCT T		29.3	77	25.2	.859	2.3	.056	.523	2000	17.9	3.7	3.6	3.2	8.7	7.6
9 C.T.		0.0	0	11.0	R	R	.045	R	2000	22.3	.9	2.6	.9	7.0	0.0
1 25 PCT T		29.3	77	25.8	.880	2.3	.056	.535	2000	17.9	5.8	3.4	3.3	8.8	7.6
2 55 PCT T		60.9	160	35.0	.574	4.5	.060	.349	2000	16.6	33.1	28.4	26.0	22.9	30.1
3 25 PCT T		28.9	76	25.3	.874	2.9	.056	.532	2000	17.9	4.8	3.6	3.4	8.7	7.5
4 10 PCT T		11.8	31	20.0	1.694	2.6	.053	1.031	2000	18.7	1.5	1.4	1.1	5.1	2.3
5 25 PCT T		28.9	76	25.2	.871	2.9	.056	.530	2000	17.9	4.4	3.6	3.4	8.6	7.5
6 90 PCT T		99.0	260	51.0	.515	8.0	.065	.313	2000	15.4	34.6	50.2	58.0	25.7	37.6
7 25 PCT T		28.6	75	25.1	.879	2.4	.056	.535	2000	17.7	3.7	3.6	3.4	8.6	7.4
8 C.T.		0.0	0	11.5	R	R	.046	R	2000	21.8	1.1	2.4	1.0	7.3	0.0
9 IDLE		0.0	0	4.1	R	R	.050	R	570	20.1	10.4	3.4	.3	4.2	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 2.1 41 7.4

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.7 45 7.0

TWO CYCLE COMPOSITE -

HC- FID 0.35(2.1) + 0.65(1.7) = 1.798 G/KW HR (1.341 BS)

CO- NDIR 0.35(40.9) + 0.65(45.2) = 43.687 G/KW HR (32.578 BS)

NOX-CL 0.35(7.4) + 0.65(7.0) = 7.130 G/KW HR (5.317 BS)

HC + NOX = 8.928 G/KW HR (6.657 BS)

SFC = .459 KG/KW HR (.754 BS)

TABLE F-12A. ENGINE 6 MINE-MODE EMISSIONS RESULTS

01 04 79 136 PM TEST 63 — 1977-78 IH404 -- PROJECT 11-5044-0 — IH404B — BAR=27.51 K= .788 HUM= 4.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	2280	.290	9.69	20	10.230	907	22	52	0	.232	R	R	R	0.0
2 25 PCT T	2332	.810	11.44	210	12.511	10433	217	1364	46	.077	7.319	45.936	1.543	22.1
3 55 PCT T	944	1.430	11.56	1099	13.096	16103	130	3552	354	.147	2.013	54.864	5.462	48.3
4 25 PCT T	160	.580	11.67	370	12.268	10070	15	962	79	.077	.495	32.376	2.675	22.1
5 10 PCT T	78	.350	10.99	114	11.349	7212	6	449	19	.057	.516	42.138	1.778	8.0
6 25 PCT T	126	.490	11.56	410	12.064	10070	12	826	90	.077	.411	28.927	3.135	21.3
7 90 PCT T	576	1.280	12.14	1594	13.485	23814	115	4566	737	.113	1.072	42.670	6.883	79.8
8 25 PCT T	136	.290	11.21	630	11.515	9752	13	496	140	.077	.421	16.285	4.583	22.7
9 C.T.	60	.150	9.28	45	9.437	4309	3	138	5	.143	R	R	R	0.0
1 25 PCT T	170	.280	11.21	615	11.509	9934	16	488	139	.077	.536	16.025	4.559	22.7
2 55 PCT T	560	.490	11.81	1700	12.363	15377	78	1231	553	.147	1.183	18.687	8.398	49.1
3 25 PCT T	150	.290	11.33	640	11.637	9888	14	498	142	.077	.460	16.138	4.614	23.0
4 10 PCT T	76	.250	9.62	188	9.878	7121	6	364	35	.057	.526	31.867	3.104	8.5
5 25 PCT T	160	.300	11.21	630	11.528	9979	15	525	143	.077	.506	17.219	4.684	22.7
6 90 PCT T	480	1.070	12.25	1700	13.374	23360	94	3775	777	.113	.886	35.406	7.287	79.5
7 25 PCT T	112	.310	11.44	665	11.762	9389	10	500	139	.077	.315	15.815	4.395	23.6
8 C.T.	64	.140	9.38	49	9.527	4309	3	128	6	.143	R	R	R	0.0
9 IDLE	1472	.570	9.69	26	10.422	953	15	105	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	2.0	R	R	.047	R	530	21.2	8.9	.9	.1	2.2	0.0
2 25 PCT T		29.7	78	23.0	.774	1.5	.057	.471	2000	17.5	29.0	7.6	2.1	8.5	7.3
3 55 PCT T		64.7	170	35.5	.548	5.5	.060	.334	2000	16.7	33.2	37.9	31.6	25.2	30.4
4 25 PCT T		29.7	78	22.2	.747	2.7	.056	.455	2000	17.9	2.0	5.4	3.7	8.2	7.3
5 10 PCT T		10.7	28	15.9	1.491	1.8	.052	.907	2000	19.3	.5	1.9	.7	4.4	1.9
6 25 PCT T		28.6	75	22.2	.777	3.1	.055	.473	2000	18.2	1.6	4.6	4.2	8.2	7.0
7 90 PCT T		107.0	281	52.5	.491	6.9	.062	.298	2000	16.2	22.4	37.5	50.6	28.6	38.6
8 25 PCT T		30.5	80	21.5	.706	4.6	.053	.429	2000	19.0	1.7	2.8	6.5	8.0	7.5
9 C.T.		0.0	0	9.5	R	R	.043	R	2000	23.1	.7	1.4	.5	6.6	0.0
1 25 PCT T		30.5	80	21.9	.719	4.6	.052	.437	2000	19.1	4.1	4.6	5.0	8.3	7.4
2 55 PCT T		65.9	173	33.9	.515	8.4	.056	.313	2000	17.8	37.4	21.9	37.7	24.7	30.4
3 25 PCT T		30.8	81	21.8	.707	4.6	.053	.430	2000	18.9	3.6	4.6	5.1	8.3	7.4
4 10 PCT T		11.4	30	15.7	1.374	3.1	.045	.836	2000	22.0	1.1	2.5	.9	4.4	2.0
5 25 PCT T		30.5	80	22.0	.722	4.7	.053	.439	2000	19.0	3.9	4.9	5.1	8.4	7.4
6 90 PCT T		106.6	280	51.5	.483	7.3	.061	.294	2000	16.4	.8	51.7	40.7	28.8	37.8
7 25 PCT T		31.6	83	20.7	.655	4.4	.054	.398	2000	18.7	2.5	4.7	5.0	7.9	7.6
8 C.T.		0.0	0	9.5	R	R	.044	R	2000	22.8	1.5	2.2	.4	6.7	0.0
9 IDLE		0.0	0	2.1	R	R	.048	R	575	20.8	11.2	3.0	.1	2.4	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 2.5 59 7.0
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.3 35 9.1

TWO CYCLE COMPOSITE -

HC- FID	0.35(2.5) + 0.65(1.3) =	1.704	G/KW HR	(1.271 BS)
CO- NDIR	0.35(58.9) + 0.65(34.7) =	43.199	G/KW HR	(32.210 BS)
NOX-CL	0.35(7.0) + 0.65(9.1) =	8.354	G/KW HR	(6.229 BS)
	HC + NOX =	10.058	G/KW HR	(7.500 BS)
	SFC =	.391	KG/KW HR	(.643 BS)

TABLE F-12B. ENGINE 6 NINE-MODE EMISSIONS RESULTS

01 04 79 359 PM TEST 64 — 1977-78 IH404 -- PROJECT 11-5044-0 — IH404C — BAR=27.61 K= .827 HUM= 5.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	2112	.320	9.59	20	10.142	907	21	58	0	.232	R	R	R	0.0
2 25 PCT T	332	.820	11.52	305	12.377	10659	32	1427	72	.077	1.063	47.418	2.397	22.4
3 55 PCT T	992	1.430	11.56	1122	13.101	16012	136	3530	376	.147	2.078	53.899	5.747	48.8
4 25 PCT T	152	.550	11.67	360	12.237	10206	14	927	82	.077	.465	30.415	2.706	22.7
5 10 PCT T	72	.340	10.88	109	11.228	7303	5	447	19	.057	.455	39.101	1.704	8.5
6 25 PCT T	120	.470	11.44	405	11.923	10024	11	798	93	.077	.374	26.532	3.107	22.4
7 90 PCT T	528	1.140	12.14	1653	13.339	23360	104	4033	795	.113	.977	37.820	7.453	79.5
8 25 PCT T	118	.290	11.33	620	11.633	9752	11	491	143	.077	.362	16.120	4.684	22.7
9 C.T.	120	.130	9.28	44	9.423	4264	6	119	5	.143	R	R	R	0.0
1 25 PCT T	156	.290	11.10	610	11.407	9888	15	508	145	.077	.493	16.668	4.765	22.7
2 55 PCT T	552	.470	11.79	1676	12.322	15195	76	1171	567	.147	1.170	17.980	8.714	48.6
3 25 PCT T	140	.290	11.33	640	11.636	9934	13	500	150	.077	.421	15.823	4.746	23.6
4 10 PCT T	68	.240	10.66	185	10.908	7212	5	321	34	.057	.408	26.305	2.756	9.1
5 25 PCT T	152	.290	11.21	630	11.517	9979	15	508	150	.077	.475	16.456	4.858	23.0
6 90 PCT T	480	.970	12.25	1676	13.274	22906	93	3381	794	.113	.878	31.825	7.473	79.2
7 25 PCT T	104	.280	11.33	650	11.622	9888	10	481	152	.077	.308	15.045	4.747	23.9
8 C.T.	60	.150	9.38	46	9.537	4309	3	137	6	.143	R	R	R	0.0
9 IDLE	1120	.590	9.90	38	10.613	1134	13	127	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	2.0	R	R	.042	R	485	21.4	11.2	1.0	.1	2.2	0.0
2 25 PCT T		30.1	79	23.5	.781	2.4	.057	.475	2000	17.7	5.7	8.4	3.1	8.8	7.3
3 55 PCT T		65.5	172	35.3	.539	5.7	.060	.328	2000	16.7	46.5	39.6	31.2	25.1	30.4
4 25 PCT T		30.5	80	22.5	.739	2.7	.056	.449	2000	17.9	2.5	5.4	3.6	8.4	7.4
5 10 PCT T		11.4	30	16.1	1.409	1.7	.051	.857	2000	19.5	.7	1.9	.6	4.4	2.1
6 25 PCT T		30.1	79	22.1	.735	3.1	.054	.447	2000	18.4	2.0	4.7	4.1	8.2	7.3
7 90 PCT T		106.6	280	51.5	.483	7.5	.061	.294	2000	16.4	27.4	34.8	50.7	28.2	38.1
8 25 PCT T		30.5	80	21.5	.706	4.7	.053	.429	2000	18.9	2.0	2.9	6.2	8.0	7.4
9 C.T.		0.0	0	9.4	R	R	.043	R	2000	23.1	2.0	1.3	.4	6.5	0.0
1 25 PCT T		30.5	80	21.8	.716	4.8	.052	.435	2000	19.2	3.9	5.0	5.0	8.3	7.4
2 55 PCT T		65.1	171	33.5	.514	8.7	.056	.313	2000	17.8	37.9	22.2	37.6	24.4	30.0
3 25 PCT T		31.6	83	21.9	.693	4.7	.053	.421	2000	18.9	3.5	5.0	5.2	8.3	7.6
4 10 PCT T		12.2	32	15.9	1.305	2.8	.050	.794	2000	20.1	1.0	2.4	.9	4.5	2.2
5 25 PCT T		30.8	81	22.0	.713	4.9	.053	.434	2000	19.0	3.8	5.0	5.2	8.4	7.4
6 90 PCT T		106.2	279	50.5	.475	7.5	.060	.289	2000	16.5	35.6	49.3	40.4	28.2	37.6
7 25 PCT T		32.0	84	21.8	.681	4.7	.053	.415	2000	18.9	2.6	4.8	5.3	8.3	7.7
8 C.T.		0.0	0	9.5	R	R	.044	R	2000	22.8	1.4	2.5	.4	6.7	0.0
9 IDLE		0.0	0	2.5	R	R	.044	R	540	20.5	10.3	3.8	.1	2.9	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 1.8 56 7.5

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.2 33 9.3

TWO CYCLE COMPOSITE -

HC- FID 0.35(1.8) + 0.65(1.2) = 1.446 G/KW HR (1.078 BS)

CO- NDIR 0.35(55.5) + 0.65(32.6) = 40.632 G/KW HR (30.299 BS)

NOX-CL 0.35(7.5) + 0.65(9.3) = 8.698 G/KW HR (6.486 BS)

HC + NOX = 10.144 G/KW HR (7.565 BS)

SFC = .389 KG/KW HR (.640 BS)

TABLE F-13A. ENGINE 7 NINE-MODE EMISSIONS RESULTS

01 30 79 TEST 71 DUR HRS 1978 CHEV 454 -- PROJECT 11-504 BAR=29.21
K= .760 HUM= 3.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	1450	1.990	9.50	13	11.651	2948	41	1017	1	.232	R	R	R	0.0
2 25 PCT T	193	.095	11.00	573	11.117	10569	20	183	137	.077	.660	5.921	4.457	23.0
3 55 PCT T	299	.101	11.70	1552	11.834	16465	46	283	545	.147	.635	3.867	7.454	54.5
4 25 PCT T	143	.098	11.10	625	11.214	10795	15	190	152	.077	.446	5.555	4.431	25.6
5 10 PCT T	76	.134	10.80	245	10.943	7847	6	195	44	.057	.429	13.817	3.147	10.5
6 25 PCT T	132	.098	11.10	652	11.213	10886	14	192	160	.077	.415	5.602	4.661	25.6
7 90 PCT T	309	1.228	13.50	1407	14.763	25174	60	4230	605	.113	.490	34.496	4.938	91.4
8 25 PCT T	108	.103	11.30	701	11.415	10433	11	191	162	.077	.320	5.564	4.718	25.6
9 C.T.	168	.128	11.10	38	11.247	4763	8	110	4	.143	R	R	R	0.0
1 25 PCT T	123	.102	11.10	690	11.215	10614	13	194	165	.077	.377	5.673	4.809	25.6
2 55 PCT T	202	.107	11.60	1507	11.730	16556	32	306	537	.147	.424	4.074	7.156	55.9
3 25 PCT T	107	.103	11.20	672	11.315	10569	11	195	158	.077	.328	5.751	4.674	25.3
4 10 PCT T	58	.154	11.00	228	11.161	7620	4	213	39	.057	.340	16.447	3.034	9.7
5 25 PCT T	115	.101	11.10	684	11.213	10523	12	191	162	.077	.358	5.691	4.834	25.0
6 90 PCT T	255	1.125	13.50	1499	14.654	25265	50	3917	652	.113	.411	32.142	5.353	90.9
7 25 PCT T	93	.103	11.20	732	11.314	10659	10	197	174	.077	.284	5.736	5.079	25.6
8 C.T.	66	.128	11.10	40	11.236	4944	3	114	4	.143	R	R	R	0.0
9 IDLE	344	.770	10.90	26	11.708	2722	9	362	2	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	6.5	R	R	.054	R	670	18.5	32.3	28.1	.1	6.6	0.0
2 25 PCT T		30.8	81	23.3	.755	4.5	.051	.459	2000	19.7	5.4	1.7	5.3	7.9	6.7
3 55 PCT T		73.1	192	36.3	.496	7.5	.054	.302	2000	18.6	23.4	4.9	40.3	23.4	30.1
4 25 PCT T		34.3	90	23.8	.694	4.4	.051	.422	2000	19.6	4.0	1.7	5.9	8.0	7.4
5 10 PCT T		14.1	37	17.3	1.228	3.1	.050	.747	2000	20.0	1.2	1.3	1.3	4.3	2.2
6 25 PCT T		34.3	90	24.0	.700	4.7	.051	.426	2000	19.6	3.8	1.8	6.2	8.1	7.4
7 90 PCT T		122.6	322	55.5	.453	4.9	.067	.275	2000	14.9	23.2	56.9	34.4	27.4	38.8
8 25 PCT T		34.3	90	23.0	.671	4.7	.052	.408	2000	19.2	2.9	1.7	6.3	7.8	7.4
9 C.T.		0.0	0	10.5	R	R	.051	R	2000	19.5	3.9	1.9	.3	6.6	0.0
1 25 PCT T		34.3	90	23.4	.683	4.8	.051	.415	2000	19.6	6.0	2.3	6.1	7.9	7.3
2 55 PCT T		75.0	197	36.5	.487	7.2	.053	.296	2000	18.7	28.1	6.8	38.2	23.6	30.6
3 25 PCT T		33.9	89	23.3	.687	4.7	.052	.418	2000	19.4	5.1	2.3	5.9	7.9	7.2
4 10 PCT T		12.9	34	16.8	1.298	3.0	.051	.789	2000	19.6	1.5	1.8	1.1	4.2	2.0
5 25 PCT T		33.5	88	23.2	.692	4.8	.051	.421	2000	19.6	5.5	2.2	6.0	7.8	7.2
6 90 PCT T		121.9	320	55.7	.457	5.4	.066	.278	2000	15.1	34.0	67.1	35.7	27.7	38.2
7 25 PCT T		34.3	90	23.5	.686	5.1	.052	.417	2000	19.4	4.5	2.3	6.5	8.0	7.3
8 C.T.		0.0	0	10.9	R	R	.051	R	2000	19.5	2.8	2.5	.3	6.8	0.0
9 IDLE		0.0	0	6.0	R	R	.054	R	675	18.7	12.4	12.7	.2	6.1	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 1.1 32 7.5
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .6 25 7.7

TWO CYCLE COMPOSITE -

HC- FID	0.35(1.1) + 0.65(.6) =	.787	G/KW HR	(.587 BS)
CO- NDIR	0.35(31.6) + 0.65(24.6) =	27.021	G/KW HR	(20.150 BS)
NOX-CL	0.35(7.5) + 0.65(7.7) =	7.617	G/KW HR	(5.680 BS)
	HC + NOX =	8.403	G/KW HR	(6.266 BS)
	SFC =	.386	KG/KW HR	(.635 BS)

TABLE F-13B. ENGINE 7 NINE-MODE EMISSIONS RESULTS

01 31 79 AM TEST 72 DUR HRS 1978 CHEV 454 -- PROJECT 11-504 BAR= 29.59

K= .753 HUM= 3.0 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	886	1.432	9.80	15	11.330	3538	31	903	1	.232	R	R	R	0.0
2 25 PCT T	180	.098	10.99	578	11.108	11340	20	202	148	.077	.602	5.957	4.355	25.3
3 55 PCT T	286	.106	11.67	1636	11.808	17010	46	309	589	.147	.604	4.054	7.739	56.8
4 25 PCT T	122	.101	11.10	674	11.219	11249	14	204	169	.077	.388	5.818	4.827	26.1
5 10 PCT T	79	.155	10.81	246	10.974	8346	7	238	47	.057	.437	15.613	3.072	11.4
6 25 PCT T	134	.101	10.99	652	11.105	11340	15	208	167	.077	.438	5.988	4.805	25.8
7 90 PCT T	251	1.089	13.59	1465	14.707	25809	50	3859	643	.113	.411	31.569	5.260	91.2
8 25 PCT T	94	.101	11.10	697	11.211	11249	10	204	175	.077	.293	5.696	4.887	26.7
9 C.T.	100	.134	10.99	38	11.135	5534	6	135	5	.143	R	R	R	0.0
1 25 PCT T	107	.101	10.99	666	11.102	11294	12	207	169	.077	.352	6.032	4.944	25.6
2 55 PCT T	211	.114	11.67	1729	11.808	16919	34	331	620	.147	.443	4.348	8.136	56.8
3 25 PCT T	105	.101	11.10	718	11.212	11249	12	204	180	.077	.334	5.819	5.143	26.1
4 10 PCT T	52	.143	10.88	238	11.029	8346	4	218	45	.057	.286	14.331	2.957	11.4
5 25 PCT T	113	.101	11.10	704	11.213	11340	13	206	178	.077	.366	5.930	5.139	25.8
6 90 PCT T	212	1.030	13.64	1435	14.694	25991	43	3679	635	.113	.349	30.004	5.177	91.4
7 25 PCT T	90	.101	11.10	742	11.211	11113	10	201	184	.077	.277	5.628	5.139	26.7
8 C.T.	100	.131	11.10	38	11.242	5670	6	134	5	.143	R	R	R	0.0
9 IDLE	351	.811	10.99	27	11.841	3538	12	490	2	.232	R	R	R	0.0

MODE	ID	UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	PERCENT OF TOTAL HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	7.8	R	R	.052	R	700	19.1	28.1	26.6	.1	7.5	0.0
2 25 PCT T		33.9	89	25.0	.738	4.4	.051	.449	2000	19.7	6.2	2.0	5.3	7.9	7.1
3 55 PCT T		76.2	200	37.5	.492	7.7	.054	.299	2000	18.6	26.7	5.8	40.6	22.8	30.6
4 25 PCT T		35.0	92	24.8	.708	4.8	.051	.431	2000	19.6	4.1	2.0	6.1	7.9	7.4
5 10 PCT T		15.2	40	18.4	1.208	3.1	.050	.735	2000	20.0	1.5	1.7	1.2	4.3	2.4
6 25 PCT T		34.7	91	25.0	.721	4.8	.051	.439	2000	19.7	4.6	2.0	6.0	7.9	7.3
7 90 PCT T		122.2	321	56.9	.465	5.3	.067	.283	2000	15.0	22.4	55.4	34.0	26.6	37.7
8 25 PCT T		35.8	94	24.8	.693	4.9	.051	.421	2000	19.6	3.2	2.0	6.3	7.9	7.5
9 C.T.		0.0	0	12.2	R	R	.051	R	2000	19.7	3.1	2.4	.3	7.2	0.0
1 25 PCT T		34.3	90	24.9	.727	4.9	.051	.442	2000	19.7	5.4	2.4	5.9	7.9	7.2
2 55 PCT T		76.2	200	37.3	.490	8.1	.054	.298	2000	18.6	29.0	7.2	41.2	22.6	30.5
3 25 PCT T		35.0	92	24.8	.708	5.1	.051	.431	2000	19.6	5.3	2.3	6.3	7.9	7.4
4 10 PCT T		15.2	40	18.4	1.208	3.0	.050	.735	2000	19.9	1.5	1.9	1.2	4.3	2.4
5 25 PCT T		34.9	91	25.0	.721	5.1	.051	.439	2000	19.6	5.7	2.4	6.2	7.9	7.3
6 90 PCT T		122.6	322	57.3	.467	5.2	.067	.284	2000	15.0	28.2	61.8	32.4	26.7	37.8
7 25 PCT T		35.8	94	24.5	.684	5.1	.051	.416	2000	19.6	4.5	2.3	6.4	7.8	7.5
8 C.T.		0.0	0	12.5	R	R	.051	R	2000	19.5	4.7	2.8	.3	7.4	0.0
9 IDLE		0.0	0	7.8	R	R	.054	R	750	18.5	15.8	16.9	.2	7.5	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- .9 29 7.8

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- .6 25 8.1

TWO CYCLE COMPOSITE -

HC= FID 0.35(.9) + 0.65(.6) = .731 G/KW HR (.545 BS)

CO= NDIR 0.35(28.8) + 0.65(24.6) = 26.069 G/KW HR (19.440 BS)

NOX-CL 0.35(7.8) + 0.65(8.1) = 7.998 G/KW HR (5.964 BS)

HC + NOX = 8.729 G/KW HR (6.510 BS)

SFC = .402 KG/KW HR (.661 BS)

TABLE F-10A. ENGINE 8 NINE-MODE EMISSIONS RESULTS

02-15-79 3:26PM TEST 83 — 1978 IH404 — IH404 — -- PROJECT 11-504 — FAR=2903 K= .917 HUM= 7.8 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOX-CL	KW
1 IDLE	2432	.489	9.38	24	10.136	1814	48	177	1	.232	R	R	R	0.0
2 25 PCT T	384	.579	11.97	101	12.592	11068	38	1027	27	.077	1.326	35.975	.946	21.3
3 55 PCT T	883	.973	12.02	46	13.092	14969	114	2247	16	.147	1.924	38.063	.271	44.0
4 25 PCT T	232	.383	12.02	125	12.429	10841	23	674	33	.077	.795	23.603	1.162	21.3
5 10 PCT T	86	.302	10.88	146	11.192	7530	6	411	30	.057	.562	35.950	2.618	8.5
6 25 PCT T	244	.218	11.79	198	12.035	10569	24	387	53	.077	.839	13.540	1.854	21.3
7 90 PCT T	581	.935	12.68	1379	13.681	21047	101	2905	646	.113	1.021	29.344	6.524	73.8
8 25 PCT T	192	.192	11.90	178	12.114	10569	19	339	47	.077	.656	11.872	1.656	21.3
9 C.T.	40	.140	9.42	46	9.564	4853	2	143	7	.143	R	R	R	0.0
1 25 PCT T	192	.192	11.79	154	12.004	10795	19	349	42	.077	.676	12.219	1.477	21.3
2 55 PCT T	488	.465	12.25	645	12.770	14560	63	1071	224	.147	1.053	18.021	3.770	44.3
3 25 PCT T	168	.187	11.79	179	11.996	10614	17	335	48	.077	.590	11.873	1.711	21.0
4 10 PCT T	60	.261	10.88	170	11.148	7575	5	358	35	.057	.340	26.879	2.639	9.9
5 25 PCT T	185	.205	11.90	173	12.126	10795	18	370	47	.077	.645	12.939	1.642	21.3
6 90 PCT T	488	1.080	12.85	1292	13.985	21364	85	3333	601	.113	.860	33.924	6.117	73.3
7 25 PCT T	148	.209	11.90	184	12.125	10523	14	366	49	.077	.503	12.805	1.702	21.3
8 C.T.	54	.144	9.42	48	9.570	4899	3	149	7	.143	R	R	R	0.0
9 IDLE	2240	.251	9.48	22	9.977	1497	37	76	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	4.0	R	R	.047	R	630	21.4	23.2	4.4	.3	4.5	0.0
2 25 PCT T		28.6	75	24.4	.854	.9	.057	.520	2000	17.4	6.1	8.5	2.3	9.0	7.5
3 55 PCT T		59.0	155	33.0	.559	.3	.060	.340	2000	16.7	34.9	35.5	2.6	23.3	29.6
4 25 PCT T		28.6	75	23.9	.837	1.2	.057	.509	2000	17.7	3.7	5.6	2.8	8.8	7.5
5 10 PCT T		11.4	30	16.6	1.453	2.6	.051	.884	2000	19.6	.8	2.5	1.9	4.5	2.2
6 25 PCT T		28.6	75	23.3	.816	1.9	.055	.496	2000	18.3	3.9	3.2	4.5	8.6	7.5
7 90 PCT T		99.0	260	46.4	.469	6.5	.062	.285	2000	16.1	23.9	35.3	80.5	25.2	38.2
8 25 PCT T		28.6	75	23.3	.816	1.7	.055	.496	2000	18.2	3.0	2.8	4.0	8.6	7.5
9 C.T.		0.0	0	10.7	R	R	.044	R	2000	22.8	.7	2.2	1.1	7.4	0.0
1 25 PCT T		28.6	75	23.8	.833	1.5	.055	.507	2000	18.3	4.5	3.8	2.7	8.9	7.5
2 55 PCT T		59.4	156	32.1	.540	3.8	.058	.329	2000	17.2	27.6	22.4	27.8	23.0	29.7
3 25 PCT T		28.2	74	23.4	.830	1.7	.055	.505	2000	18.3	3.8	3.7	3.1	8.8	7.4
4 10 PCT T		13.3	35	16.7	1.253	2.6	.051	.762	2000	19.6	.8	2.9	1.7	4.6	2.6
5 25 PCT T		28.6	75	23.8	.833	1.6	.055	.507	2000	18.1	4.3	4.0	3.0	8.9	7.5
6 90 PCT T		98.2	258	47.1	.479	6.1	.064	.292	2000	15.7	28.7	53.6	57.3	25.9	37.8
7 25 PCT T		28.6	75	23.2	.812	1.7	.055	.494	2000	18.1	3.3	4.0	3.2	8.7	7.5
8 C.T.		0.0	0	10.8	R	R	.044	R	2000	22.7	1.3	3.0	.9	7.5	0.0
9 IDLE		0.0	0	3.3	R	R	.046	R	600	21.8	25.7	2.5	.2	3.7	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 2.2 43 4.2
SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.5 32 5.4

TWO CYCLE COMPOSITE -

HC- FID	0.35(2.2) + 0.65(1.5) =	1.754	G/KW HR	(1.308 BS)
CO- NDIR	0.35(42.6) + 0.65(32.1) =	35.758	G/KW HR	(26.665 BS)
NOX-CL	0.35(4.2) + 0.65(5.4) =	4.969	G/KW HR	(3.705 BS)
	HC + NOX =	6.723	G/KW HR	(5.013 BS)
	SFC =	.428	KG/KW HR	(.703 BS)

TABLE F-14B. ENGINE 8 NINE-MODE EMISSIONS RESULTS

02-19-79 TEST 85 1978 IH404 -- PROJECT 11-504

3-Minute Modes

BAR= 29.44 K= .747 HUM= 2.9 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOX-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOX	WT. FACT.	MODAL G/KWHR HC-FID	CO	NOX-CL	KW
1 IDLE	2240	.282	9.59	30	10.118	1406	34	79	1	.232	R		R	0.0
2 25 PCT T	248	.146	11.67	199	11.843	10659	25	265	44	.077	.884	9.394	1.576	21.0
3 55 PCT T	424	.269	12.25	910	12.567	14878	56	644	267	.147	.896	10.242	4.252	46.9
4 25 PCT T	196	.146	11.67	233	11.837	10387	19	258	51	.077	.638	8.579	1.685	22.4
5 10 PCT T	76	.250	10.77	195	11.028	7167	5	328	31	.057	.464	27.767	2.662	8.8
6 25 PCT T	188	.146	11.67	225	11.837	10478	19	260	49	.077	.625	8.765	1.663	22.1
7 90 PCT T	344	.910	13.10	1653	14.049	22453	62	2937	655	.113	.591	27.839	6.211	78.7
8 C.T.	152	.146	11.79	240	11.953	10523	15	259	52	.077	.503	8.718	1.764	22.1
9 C.T.	39	.117	9.28	51	9.401	4672	2	118	6	.143	R	R	R	0.0
1 25 PCT T	248	.146	11.67	199	11.843	10659	25	265	44	.077	.884	9.394	1.576	21.0
2 55 PCT T	424	.269	12.25	910	12.567	14878	56	644	267	.147	.896	10.242	4.252	46.9
3 25 PCT T	196	.146	11.67	233	11.837	10387	19	258	51	.077	.638	8.579	1.685	22.4
4 10 PCT T	76	.250	10.77	195	11.028	7167	5	328	31	.057	.464	27.767	2.662	8.8
5 25 PCT T	188	.146	11.67	225	11.837	10478	19	260	49	.077	.625	8.765	1.663	22.1
6 90 PCT T	344	.910	13.10	1653	14.049	22453	62	2937	655	.113	.591	27.839	6.211	78.7
7 25 PCT T	152	.146	11.79	240	11.953	10523	15	259	52	.077	.503	8.718	1.764	22.1
8 C.T.	39	.117	9.28	51	9.401	4672	2	118	6	.143	R	R	R	0.0
9 IDLE	2240	.282	9.59	30	10.118	1406	34	79	1	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	3.1	R	R	.047	R	550	21.5	26.6	3.3	.2	3.5	0.0
2 25 PCT T		28.2	74	23.5	.834	1.6	.054	.507	2000	18.6	6.4	3.6	2.6	8.8	7.0
3 55 PCT T		62.8	165	32.8	.522	4.3	.057	.318	2000	17.5	27.7	16.9	29.9	23.4	29.9
4 25 PCT T		30.1	79	22.9	.761	1.7	.054	.463	2000	18.6	5.0	3.5	3.0	8.5	7.5
5 10 PCT T		11.8	31	15.8	1.338	2.7	.050	.814	2000	19.8	1.0	3.3	1.4	4.4	2.2
6 25 PCT T		29.7	78	23.1	.778	1.7	.054	.473	2000	18.6	4.8	3.6	2.9	8.6	7.4
7 90 PCT T		105.5	277	49.5	.469	6.2	.064	.285	2000	15.7	23.6	59.2	56.3	27.1	38.6
8 25 PCT T		29.7	78	23.2	.781	1.8	.054	.475	2000	18.4	3.9	3.6	3.1	8.7	7.4
9 C.T.		0.0	0	10.3	R	R	.043	R	2000	23.1	1.0	3.0	.7	7.1	0.0
1 25 PCT T		28.2	74	23.5	.834	1.6	.054	.507	2000	18.6	6.4	3.6	2.6	8.8	7.0
2 55 PCT T		62.8	165	32.8	.522	4.3	.057	.318	2000	17.5	27.7	16.9	29.9	23.4	29.9
3 25 PCT T		30.1	79	22.9	.761	1.7	.054	.463	2000	18.6	5.0	3.5	3.0	8.5	7.5
4 10 PCT T		11.8	31	15.8	1.338	2.7	.050	.814	2000	19.8	1.0	3.3	1.4	4.4	2.2
5 25 PCT T		29.7	78	23.1	.778	1.7	.054	.473	2000	18.6	4.8	3.6	2.9	8.6	7.4
6 90 PCT T		105.5	277	49.5	.469	6.2	.064	.285	2000	15.7	23.6	59.2	56.3	27.1	38.6
7 25 PCT T		29.7	78	23.2	.781	1.8	.054	.475	2000	18.4	3.9	3.6	3.1	8.7	7.4
8 C.T.		0.0	0	10.3	R	R	.043	R	2000	23.1	1.0	3.0	.7	7.1	0.0
9 IDLE		0.0	0	3.1	R	R	.047	R	550	21.5	26.6	3.3	.2	3.5	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 1.3 24 5.7

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 1.3 24 5.7

TWO CYCLE COMPOSITE -

HC- FID 0.35(1.3) + 0.65(1.3) = 1.295 G/KW HR (.966 BS)

CO- NDIR 0.35(24.3) + 0.65(24.3) = 24.336 G/KW HR (18.147 BS)

NOX-CL 0.35(5.7) + 0.65(5.7) = 5.705 G/KW HR (4.254 BS)

HC + NOX = 7.000 G/KW HR (5.220 BS)

SFC = .907 KG/KW HR (.668 BS)

TABLE F-15A. ENGINE 10 NINE-MODE EMISSIONS RESULTS

05 01 79 TEST 10-4 1979 GM292 PROJECT 11-5044-001

K= .959 HUM= 9.2 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOx-CL	TOTAL CARBON	FUEL G/HR	CALCULATED HC	G/HR CO	NOX	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOx-CL	KW
1 IDLE	9856	.102	7.10	76	8.260	1497	192	37	4	.232	R	R	R	0.0
2 25 PCT T	378	1.158	11.19	695	12.391	7167	24	1353	128	.077	1.234	68.343	6.461	14.8
3 55 PCT T	915	1.359	11.66	2351	13.122	10886	85	2277	621	.147	1.931	51.554	14.054	32.9
4 25 PCT T	186	.973	11.54	763	12.534	7167	12	1124	139	.077	.613	57.861	7.150	14.5
5 10 PCT T	147	.595	10.51	190	11.121	4990	7	539	27	.057	1.010	74.491	3.750	5.4
6 25 PCT T	124	.846	11.66	790	12.520	7167	8	928	144	.077	.402	49.385	7.269	14.8
7 90 PCT T	611	1.236	12.40	3012	13.706	15609	79	2844	1091	.113	1.081	39.096	15.006	54.2
8 25 PCT T	44	.554	12.27	774	12.829	7484	3	652	144	.077	.146	32.947	7.258	14.8
9 C.T.	4480	.152	8.17	87	8.808	3175	175	111	10	.143	R	R	R	0.0
1 25 PCT T	98	.708	11.90	755	12.619	7167	6	812	136	.077	.322	41.833	7.027	14.5
2 25 PCT T	652	1.181	11.90	2500	13.155	10886	61	1975	659	.147	1.398	45.485	15.169	32.4
3 25 PCT T	64	.654	12.07	798	12.731	7212	4	748	144	.077	.210	38.523	7.409	14.5
4 10 PCT T	108	.568	10.51	212	11.090	4990	5	516	30	.057	.707	67.779	3.986	5.7
5 25 PCT T	64	.629	11.90	773	12.586	7031	4	766	137	.077	.206	39.456	7.077	14.5
6 90 PCT T	562	1.478	12.07	2823	13.612	15876	74	3483	1048	.113	1.027	48.394	14.561	53.7
7 25 PCT T	32	.485	12.35	783	12.839	7257	2	554	141	.077	.107	29.092	7.399	14.2
8 C.T.	4544	.156	8.20	76	8.849	3084	172	110	8	.143	R	R	R	0.0
9 IDLE	8960	.079	7.06	55	8.100	998	118	20	2	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	3.3	R	R	.039	R	700	25.8	46.8	.8	.4	5.2	0.0
2 25 PCT T		19.8	52	15.8	.798	6.5	.057	.485	2000	17.6	2.0	10.1	3.8	8.3	7.2
3 55 PCT T		44.2	114	24.0	.543	14.1	.060	.330	2000	16.6	13.2	32.6	34.9	24.0	30.6
4 25 PCT T		19.4	51	15.8	.814	7.2	.057	.495	2000	17.5	1.0	8.4	4.1	8.3	7.1
5 10 PCT T		7.2	19	11.0	1.520	3.8	.051	.925	2000	19.6	.4	3.0	.6	4.3	1.4
6 25 PCT T		19.8	52	15.8	.798	7.3	.057	.485	2000	17.5	.6	7.3	4.2	8.3	7.2
7 90 PCT T		72.7	191	34.4	.473	15.0	.062	.288	2000	16.0	9.4	31.3	47.2	24.4	38.8
8 25 PCT T		19.8	52	16.5	.833	7.3	.058	.507	2000	17.2	.2	4.9	4.2	8.6	7.2
9 C.T.		0.0	0	7.0	R	R	.041	R	2000	24.5	26.4	1.5	.5	6.8	0.0
1 25 PCT T		19.4	51	15.8	.814	7.0	.057	.495	2000	17.4	.7	6.5	4.0	8.4	7.2
2 55 PCT T		43.4	114	24.0	.553	15.2	.060	.336	2000	16.6	12.6	30.4	37.0	24.4	30.5
3 25 PCT T		19.4	51	15.9	.819	7.4	.058	.498	2000	17.3	.4	6.0	4.2	8.5	7.2
4 10 PCT T		7.6	20	11.0	1.444	4.0	.051	.879	2000	19.7	.4	3.1	.7	4.3	2.1
5 25 PCT T		19.4	51	15.5	.798	7.1	.057	.485	2000	17.4	.4	6.2	4.0	8.3	7.2
6 90 PCT T		72.0	189	35.0	.486	14.6	.062	.296	2000	16.1	11.8	41.2	45.3	27.4	38.9
7 25 PCT T		19.0	50	16.0	.840	7.4	.058	.511	2000	17.2	.2	4.5	4.1	8.5	7.0
8 C.T.		0.0	0	6.8	R	R	.041	R	2000	24.4	34.6	1.6	.5	6.7	0.0
9 IDLE		0.0	0	2.2	R	R	.038	R	700	26.4	38.8	.5	.2	3.5	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 6.0 65 16.5

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 4.5 61 16.8

TWO CYCLE COMPOSITE -

HC- FID	0.35(6.0) + 0.65(4.5) =	5.059	G/KW HR	(3.772 BS)
CO- NDIR	0.35(65.0) + 0.65(61.3) =	62.601	G/KW HR	(46.681 BS)
NOX-CL	0.35(16.5) + 0.65(16.8) =	16.699	G/KW HR	(12.453 BS)
	HC + NOX =	21.758	G/KW HR	(16.225 BS)
	SFC =	.421	KG/KW HR	(.693 BS)

TABLE F-15B. ENGINE 10 NINE-MODE EMISSIONS RESULTS

1979 GM292 PROJECT 11-5044-001

05 01 79 TEST 10-5 K= .969 HUM= 9.5 G/KG

MODE	CONCENTRATION AS MEASURED HC-FID	CO	CO2	NOx-CL	TOTAL CARBON	FUEL G/HR	CALCULATED G/HR HC	CO	NOx	WT. FACT.	-----MODAL G/KWHR----- HC-FID	CO	NOx-CL	KW
1 IDLE	8064	.089	7.02	98	7.973	1406	152	32	6	.232	R	R	R	0.0
2 25 PCT T	362	1.145	10.29	705	11.475	7031	25	1417	139	.077	1.318	75.956	7.449	13.9
3 55 PCT T	931	1.385	10.47	2311	11.959	10932	95	2558	679	.147	2.219	59.978	15.927	31.8
4 25 PCT T	194	.998	10.42	800	11.439	7167	13	1263	161	.077	.708	66.314	8.465	14.2
5 10 PCT T	164	.605	9.65	208	10.273	4763	8	567	31	.057	1.098	74.427	4.071	5.7
6 25 PCT T	136	.873	10.85	815	11.738	7167	9	1077	160	.077	.485	56.560	8.404	14.2
7 90 PCT T	614	1.637	11.19	2975	12.896	16239	87	4164	1205	.113	1.185	56.950	16.476	54.5
8 25 PCT T	48	.575	11.19	823	11.771	7575	3	748	170	.077	.181	39.285	8.945	14.2
9 C.T.	4992	.155	7.45	80	8.143	2903	192	112	9	.143	R	R	R	0.0
1 25 PCT T	112	.762	10.40	794	11.175	7167	8	988	164	.077	.418	51.873	8.600	14.2
2 55 PCT T	722	1.134	10.51	2591	11.724	10932	75	2135	777	.147	1.693	48.343	17.587	32.9
3 25 PCT T	72	.709	10.73	815	11.447	7257	5	908	166	.077	.266	47.708	8.726	14.2
4 10 PCT T	116	.562	9.65	207	10.224	4672	6	518	30	.057	.806	71.657	4.204	5.4
5 25 PCT T	70	.699	10.96	826	11.667	7031	5	851	160	.077	.247	44.695	8.407	14.2
6 90 PCT T	536	1.532	11.42	2823	13.012	16148	75	3839	1127	.113	1.021	52.510	15.408	54.5
7 25 PCT T	35	.512	11.42	850	11.935	7303	2	632	167	.077	.123	32.552	8.611	14.5
8 C.T.	4480	.155	7.85	79	8.489	2858	163	105	9	.143	R	R	R	0.0
9 IDLE	10240	.074	6.64	53	7.808	1406	197	27	3	.232	R	R	R	0.0

MODE	ID	----UNITS AS SPECIFIED IN THE 9-08-77 PROCEDURE---- HP	TQ	FC	BSFC	BSNOX	F/A	SFC KG/KW HR	RPM	CALC A/F	--------PERCENT OF TOTAL-------- HC	CO	NOX	FUEL	POWER
1 IDLE		0.0	0	3.1	R	R	.037	R	700	26.8	38.9	.6	.4	4.9	0.0
2 25 PCT T		18.7	49	15.5	.831	7.4	.053	.505	2000	19.0	2.1	8.7	3.7	8.1	6.9
3 55 PCT T		42.7	112	24.1	.565	15.9	.055	.344	2000	18.2	15.3	30.1	34.6	24.0	30.1
4 25 PCT T		19.0	50	15.8	.830	8.5	.053	.505	2000	19.0	1.1	7.8	4.3	8.3	7.0
5 10 PCT T		7.6	20	10.5	1.379	4.1	.047	.839	2000	21.2	.5	2.6	.6	4.1	2.1
6 25 PCT T		19.0	50	15.8	.830	8.4	.054	.505	2000	18.6	.8	6.6	4.3	8.3	7.0
7 90 PCT T		73.1	192	35.8	.490	16.5	.059	.298	2000	16.9	10.8	37.7	47.1	27.5	39.7
8 25 PCT T		19.0	50	16.7	.877	8.9	.054	.534	2000	18.6	.3	4.6	4.5	8.7	7.0
9 C.T.		0.0	0	6.4	R	R	.038	R	2000	26.4	30.2	1.3	.5	6.2	0.0
1 25 PCT T		19.0	50	15.8	.830	8.6	.051	.505	2000	19.5	.7	7.2	4.3	8.3	7.0
2 55 PCT T		44.2	116	24.1	.546	17.6	.054	.332	2000	18.6	12.2	29.6	38.6	24.2	30.8
3 25 PCT T		19.0	50	16.0	.840	8.7	.052	.511	2000	19.1	.4	6.6	4.3	8.4	7.0
4 10 PCT T		7.2	19	10.3	1.424	4.2	.047	.866	2000	21.3	.4	2.8	.6	4.0	2.0
5 25 PCT T		19.0	50	15.5	.814	8.4	.053	.495	2000	18.7	.4	6.2	4.2	8.1	7.0
6 90 PCT T		73.1	192	35.6	.487	15.4	.060	.296	2000	16.8	9.3	41.0	43.0	27.5	39.2
7 25 PCT T		19.4	51	16.1	.829	8.6	.054	.504	2000	18.4	.2	4.6	4.4	8.5	7.1
8 C.T.		0.0	0	6.3	R	R	.039	R	2000	25.3	25.8	1.4	.4	6.1	0.0
9 IDLE		0.0	0	3.1	R	R	.037	R	700	27.3	50.6	.6	.2	4.9	0.0

SUM---(COMPOSITE VALUE FOR CYCLE 1)---------- 5.9 81 18.6

SUM---(COMPOSITE VALUE FOR CYCLE 2)---------- 5.8 67 18.8

TWO CYCLE COMPOSITE -

HC- FID 0.35(5.9) + 0.65(5.8) = 5.788 G/KW HR (4.316 BS)

CO- NDIR 0.35(80.5) + 0.65(67.4) = 72.006 G/KW HR (53.695 BS)

NOX-CL 0.35(18.6) + 0.65(18.8) = 18.760 G/KW HR (13.989 BS)

HC + NOX = 24.548 G/KW HR (18.305 BS)

SFC = .426 KG/KW HR (.700 BS)